

# PAGE'S WEEKLY

A Weekly Journal Devoted to the Engineering, Shipbuilding,  
Iron and Steel Trades.

OFFICES: CLUN HOUSE, SURREY STREET, STRAND, LONDON, W.C.

No. 76. VOL. 8.  
Registered as a Newspaper.

LONDON, FRIDAY, FEBRUARY 23, 1906.

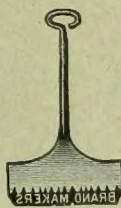
PRICE 6d.

## MARKS, NAME STAMPS, BRANDING IRONS,



Sets of Letter & Figure Punches,  
Embossing Presses, Dies, Seals,  
Moulders' Letters & Figures,  
Brass Name Plates,  
Stencil Plates,

BRASS LABELS and  
TIME CHECKS.



**EDWARD PRYOR & SON,**  
68, West Street, **SHEFFIELD.**

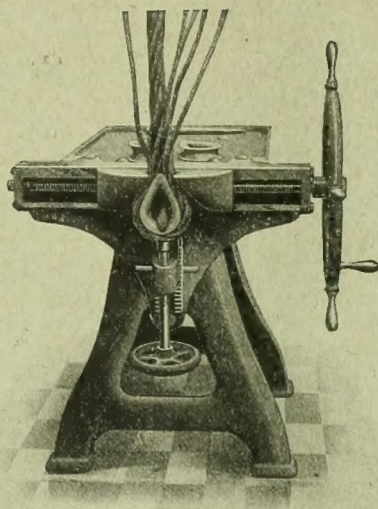
## McLAREN'S Steam Ploughs AND TRACTION ENGINES.

Catalogues and Pamphlets mailed free on application to—

**J. & H. McLAREN, Midland Engine Works, LEEDS.**

Cable Address: "McLAREN, LEEDS."

Codes used: **A B C 4th and 5th Editions, LIEBERS;**  
Established 1876.



Cable Bending and Splicing Vise.

SEND FOR DESCRIPTION.

**J. PARKINSON & SON**  
**SHIPLEY, ENGLAND.**

Cables: "TEMPLES, SHIPLEY."

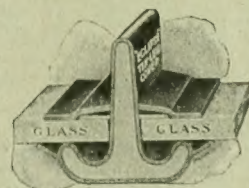
Code: A B C 5th Edition.

## MELLOWES & Co., LIMITED.

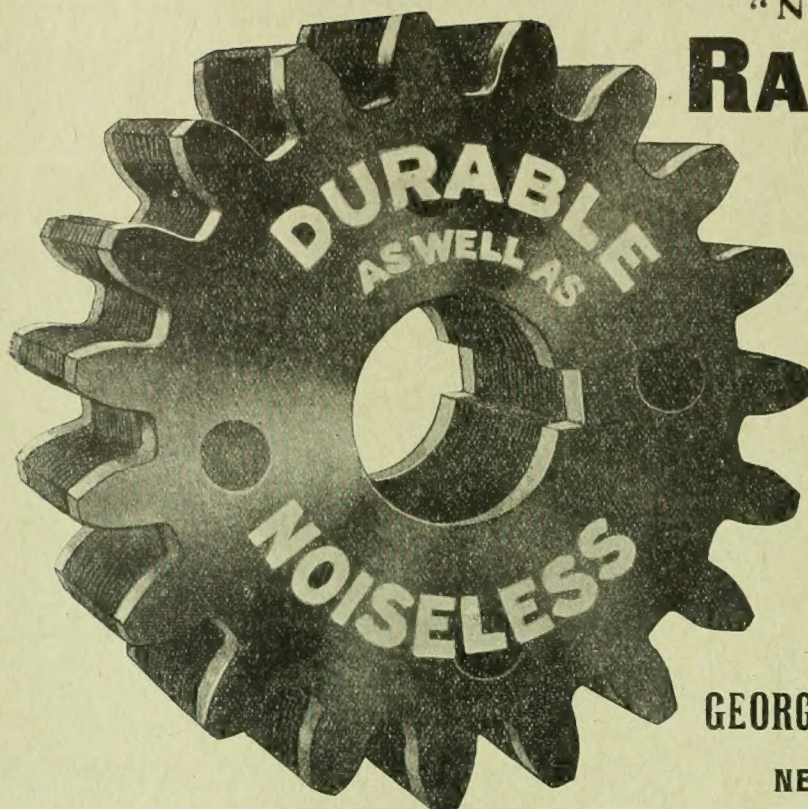
PATENT, "ECLIPSE"  
ROOF-GLAZING.

**SHEFFIELD:** Head Office and Works.  
**London Offices:** 28, Victoria Street,  
**WESTMINSTER.**

1,600,000 super ft. fixed in 1904.







**"NEW PROCESS"**  
**RAW HIDE**  
**GEARS.**

All Teeth Cut to  
Brown & Sharpe's  
Standards.

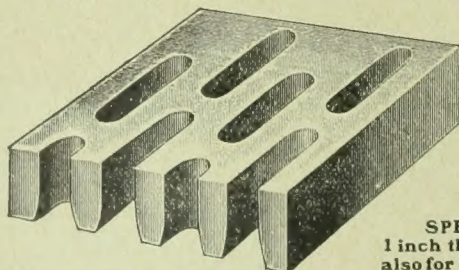
**ALSO METAL GEARS.**

*Send for Descriptive  
Catalogue.*

**GEORGE ANGUS & CO., Ltd.,**  
**NEWCASTLE-ON-TYNE.**

**CYCLONE FANS** FOR  
MATTHEWS & YATES, Ltd., **Induced Draught.**  
Swinton, Manchester.

**PERFORATED METALS** OF ALL KINDS



MAKERS OF . . .  
Filter Press Plates.  
Rotary Sifting Plates, etc., etc.  
Revolving Screens and Trommels,  
Black and Galvanized.  
Embossed Plates for Stair Treads  
and Locomotive Steps.  
Special Designs of Perforated Plates  
made exactly to drawings and  
up to one inch thick.



SPECIALITY.—Heavy Steel Plates up to  
1 inch thick with narrow slots for crushing rolls;  
also for quarries, etc., in special hard quality steel.

**ANDREW BROWN & Co., 110, CANNON STREET, E.C.**

Sole Agents for FR. MEGUIN & CO., Ltd.

Telegraphic Address: "Browpost, London."

Illustrated Catalogue Free.

Telephone: 8168 BANK.



# PAGE'S WEEKLY

## Miscellaneous

### Mr. G. H. HUGHES, M.I.Mech.E.,

Consulting and Organising Engineer for Water  
Works and Industrial Undertakings,

19, OLD QUEEN ST., WESTMINSTER, S.W.

Telephone No.: 5754 Bank.

Write for particulars.

### A. MOUNT-HAES,

M.I.Mech.E., M.I.M.E.,

Consulting and Mining Engineer for Ore Dressing  
Plants of All Classes.

11, IRONMONGER LANE, LONDON. E.C.

Tel. Address: "DRESSINGS, LONDON."

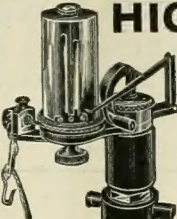

Telephone No.: 272 Central.

**HIGH SPEED INDICATORS.**

**Hannan & Buchanan,**  
75, Robertson Street, Glasgow.

**ENGINE COUNTERS,  
BOURDON GAUGES.**

On Admiralty List.  
Engineering Instrument Makers

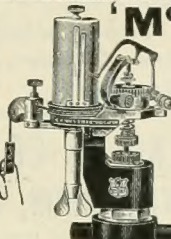



**'McINNES-DOBBIE' INDICATORS.**

In Two types: External and Enclosed Pressure Springs.  
Each made in several forms and sizes to suit all speeds and pressures.  
Special Indicators for Gas, Winding, and Ammonia Engines, and for Motor-Cars.

**DOBBIE, McINNES, LIMITED,**  
45, BOTHWELL ST., GLASGOW.

Adopted by the British, French and Japanese Admiralties.



### PATENTS.

**Mr. J. G. LORRAIN, M.I.E.E., M.I.Mech.E.,** Fellow of the  
Chartered Institute of Patent Agents.

NORFOLK HOUSE, NORFOLK STREET, STRAND, LONDON, W.C.

"PATENTEES' HANDBOOK," post free on application, gives Full  
Information to Inventors and upon all the chief points of the Patent Law.

Telegrams: "Lorrain, London."

### BABCOCK & WILCOX, Ltd.

#### PATENT WATER-TUBE BOILERS.

These Boilers are in use throughout the world to the extent of 4,700,000 h.p.  
generating steam for all purposes, and fired with all kinds of fuel.

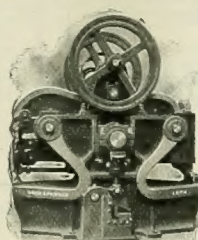
See our Advertisement appearing March 16th, page 37.

HEAD OFFICES—Oriel House, Farringdon Street, LONDON, E.C.

WORKS—Renfrew, SCOTLAND.

**PUNCHING & SHEARING Machines.**  
**STEAM HAMMERS.**  
**Shipbuilders' MACHINE TOOLS.**

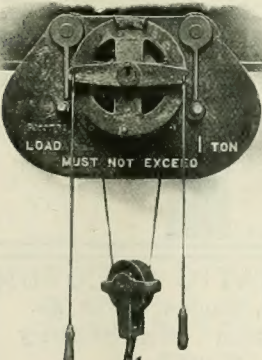
**DAVIS & PRIMROSE,**  
Leith Ironworks, EDINBURGH.



**ELECTRIC PULLEY . . . BLOCKS . . .**

For 5 and 10 cwt., and 1, 2, and 3 tons.  
Portable Electrical Drilling Equipments and Flexible Shafts.

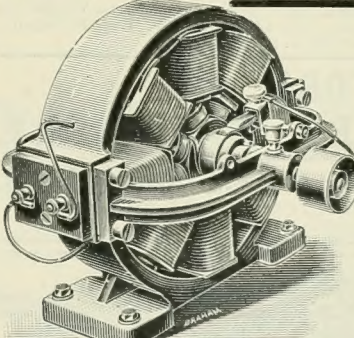
**KRAMOS, Ltd.,**  
Locksbrook Engineering Works,  
**BATH.**



**The Crypto Electrical Co.,**  
3, Tyer's Gateway,  
Bermondsey St.,  
LONDON, S.E.

Makers of  
**DYNAMOS,  
ALTERNATORS,  
ETC.**

Send for Catalogue.



COMPLETE INSTALLATIONS OF  
MODERN MACHINERY.

Catalogue E.

**LAUNDRY MACHINERY**

**HILL & HERBERT, Ltd.,**  
Laundry Engineers, LEICESTER.

In handsome cloth. With 59 Illustrations. 6s. net.

### SMOKE ABATEMENT.

A Manual for the use of Manufacturers, Inspectors, Medical Officers of Health, Engineers, and others.

By **WILLIAM NICHOLSON,**

Chief Smoke Inspector to the Sheffield Corporation.

"This practical book . . . is likely to meet a long felt want."—  
*British Medical Journal.*

LONDON: CHAS. GRIFFIN & CO., Ltd., 12, EXETER STREET, STRAND, W.C.

Large 8vo. Handsome cloth. 16s. net.

### FIRE AND EXPLOSION RISKS.

A Handbook of the Detection, Investigation, and Prevention of Fires and Explosions.

By **DR. VON SCHWARTZ.**

Translated by C. T. C. SALTER.

"A wealth of information on the chemistry of fire and kindred topics."—*Fire and Water.*



# PAGE'S WEEKLY

## Miscellaneous

**WALTER SCOTT, LTD.,**

MANUFACTURERS OF

**Rolled Steel Joists, Channels, etc.**

Mild Steel Blooms, Billets, Slabs, Tinbars, Rounds and Flats.

**Speciality: TRAMRAILS.**

LEEDS STEEL  
WORKS, LEEDS,  
ENGLAND.

**TOMEY & SON'S**  
EUREKA GAUGE GLASS  
ESTABLISHED  
1853  
ASTON  
BIRMINGHAM.

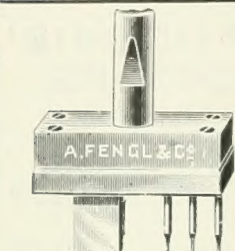
A NEW GAUGE GLASS.

Samples, Lists, and  
Testimonials on application.

**"S.H.P."**

Tested to  
350 lb. Steam  
Pressure.

For High Pressure  
Boilers.



DO YOU WANT ANY  
**Press Tools, Jigs,  
Cutters, Rimers,  
Gauges?**

If so, send your requirements, and

**A. FENGL & CO.,**  
**ALTRINCHAM,**

will submit design and price.

Inventors' Models Worked Out  
and Manufactured.

STAMPINGS TO THE TRADE.  
Telegrams: "Fengl, Altrincham."

**WEST PASCAGOULA CREOSOTING WORKS,**  
**WEST PASCAGOULA, MISS., U.S.A.**

Situated on Pascagoula Bay and on the line of the Louisville and Nashville Railroad. These works have been in operation for more than twenty-six years. ORDERS for Creosoted Piles, Telegraph Poles, Cross Arms, Electric Conduits, Paving Blocks, Sawed Tiles, and Timber PROMPTLY EXECUTED. New cylinders, 115 ft. long. Capacity, one million feet per month. A.B.C. Code used. Cable address: Pierre, West Pascagoula, Miss.—Address, JNO. B. LINDSEY, Superintendent.

**DESTRUCTORS and  
CLINKER MACHINERY.**

**Horsfall Destructor Co., Ltd., Armley, Leeds.**

Telegrams: "DESTRUCTOR." Telephone: 2006.  
Codes: A.B.C. (5th Edition) and Leibers.

**STONE BREAKERS,  
GRAVEL WASHERS, ETC.**  
**SAMUEL PEGG & SONS, Engineers,**  
**LEICESTER, England.**

SEND FOR ILLUSTRATED CATALOGUE.

### ROOFING

**McTEAR & COMPANY, LTD.**  
ROOF CONTRACTORS, FELT MANUFACTURERS, ETC.  
NEWTOWNARDS ROAD, BELFAST.

THE MAXIMUM OF AREA COVERED AT THE MINIMUM OF COST.  
THE BEST ROOF FOR ALL PURPOSES. NEAT & STRONG.

FOR TANNERS. IRON FOUNDERS, ENGINEERS. ROPEWALKS, COLLIERIES, SHIPBUILDERS, ELECTRICIANS.

SITES INSPECTED — ESTIMATES FREE

**Melville and Macalpine, Consulting Engineers**  
and NAVAL ARCHITECTS,  
615, WALNUT STREET, PHILADELPHIA, PA., U.S.A.  
Rear-Admiral GEORGE W. MELVILLE, Ex-Engineer-in-Chief of the United States Navy, and JOHN H. MACALPINE, having a very extensive acquaintance in the best engineering circles in the United States, Britain, and the Continent of Europe, especially SOLICIT INTERNATIONAL BUSINESS.



Standard of  
the World.  
**J. H. WILLIAMS  
& CO.,**  
Drop-forgings  
only.  
Brooklyn, New York

**RIVETS, BOLTS, & SCREWS**

Of all Descriptions and for all Purposes.

SEND FOR CATALOGUE.

**T. D. ROBINSON & CO., Ltd.,**  
**DERBY.**

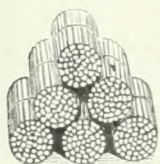
**SHONE PNEUMATIC EJECTORS**

FOR RAISING SEWAGE, SLUDGE, WATER, &c.

**Air Compressing Machinery**  
FOR ALL SERVICES.

**HUGHES & LANCASTER**

16, VICTORIA STREET, LONDON, S.W.



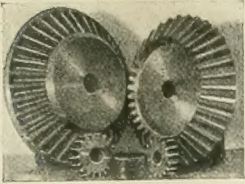
**FIREWOOD & LIGHTER-MACHINERY**  
Does the work of from 12 to 80 men. The saving in wages alone represents  
**A CERTAIN LARGE INCOME,**  
Also Saw Moulder & Planer Guards, Saw Benches & Sharpeners.  
**M. GLOVER & CO., Patentees, LEEDS.**





# PAGE'S WEEKLY

## Miscellaneous



### Rawhide Gears

A SPECIALITY.

Also all kinds of Metal Gearing.

**AD. AHLERS,**

Whitley Bay, Newcastle-on-Tyne.

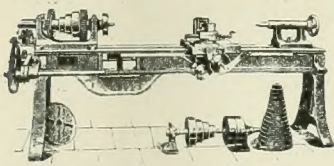
## THOMAS GREENWOOD

Waterside, HALIFAX,  
has ready for immediate delivery

**200**

ENGINEERS' and BOILER MAKERS'  
MACHINE TOOLS.

Tell me your wants or send for Catalogue.



HIGH-CLASS  
MACHINE TOOLS

In stock for immediate delivery.

**THOS. W. WARD, L<sup>d</sup>**

Albion Works,  
SHEFFIELD

## Refuse Destructors.

Write for particulars to:—

**HEENAN & FROUDE, LIMITED,**

4, Chapel Walks, MANCHESTER.

Works: MANCHESTER and WORCESTER.

## Ebonestos Mfg. Co.,

Patentees and Manufacturers of

The "EBONESTOS"

## INSULATORS

Suitable for BUSHING, NIPPLES,  
SWITCH HANDLES, and other  
Insulating Fittings.



Telephone:  
422 Holborn.

22, Rosoman Street, Clerkenwell,  
LONDON, E.C.



# Steel Pipes.

**WELDED &  
RIVETTED.**

THOMAS PIGGOTT & CO., LTD., SPRING HILL, BIRMINGHAM.

Send for Estimates.

## "TURPOLENE"

A perfect substitute for American Spirits of Turpentine for  
Painters, Printers, Varnish Makers, and for all other  
purpose where Turpentine is used.

Same odour, same flash point, same result in the working as in genuine  
Turps. We are the original and only makers of genuine Turpolene.

**THE RELIANCE LUBRICATING OIL CO.,**  
19 & 20, Water Lane, Great Tower Street, London, E.C.  
Branches at Glasgow, Bristol, Hull, Newcastle-on-Tyne, &c.

## BERTRAMS, Ltd.,

Sciennes, EDINBURGH.

MACHINE TOOLS.

See  
Next  
Week.

## EDGAR ALLEN & CO.,

Limited,

Sheffield.

**TRAMWAY MATERIAL.**

IN ALLEN'S



MANGANESE STEEL.



# PAGE'S WEEKLY

## Contracts

### CONTRACTS.

#### PONTYPRIDD URBAN DISTRICT COUNCIL.

The Urban District Council of Pontypridd are prepared to receive TENDERS for the following:—

Section K.—RESERVOIR.

" L.—CONDENSING PLANT, COOLING TOWER, and TANK.

" U.—ARTESIAN WELL.

Specifications, Quantities, General Conditions, and Forms of Tender, may be obtained on and after the 12th inst. at the offices of the Consulting Engineer, Mr. REGINALD P. WILSON, 66, Victoria Street, Westminster, or at the Council Offices, Pontypridd, on payment of the sum of Three Guineas for each section.

This sum is required as a deposit, and will, after the Council shall have entered into a contract upon the Tenders received, but not before, be returned to the tenderer, provided he shall have sent in a *bona fide* Tender, and shall not have withdrawn the same. In any other case the deposit will be forfeited.

The Tender must be sent in on the official form, and all instructions contained therein must be complied with.

Tenders, endorsed "Section K.—Reservoir," "Section L.—Condensers," or "Section U.—Artesian Well," must be addressed to the Clerk of the Pontypridd Urban District Council, and must be delivered at the Council Offices, Pontypridd, not later than 12 noon on Saturday, March 3rd, 1906.

The Council do not bind themselves to accept the lowest or any Tender.

J. COLENSO JONES,

Clerk to the Council.

Council Offices, Pontypridd.

#### BRADFORD POOR LAW UNION.—The

Guardians of the Bradford Poor Law Union are prepared to receive TENDERS from Masons and Bricklayers for the erection of PUMP-ROOM and STEAM-BOILER CHIMNEY, also TENDERS from Heating Engineers for the INSTALLATION of a SYSTEM of ATMOSPHERIC STEAM HEATING and MACHINERY in connection therewith, at the Union Hospital, Horton Lane, Bradford.

Contractors desirous of tendering for these Works are requested to forward their applications, along with a deposit of £2 2s. for each separate Contract (which will be returned on receipt of *bona fide* Tender), to Mr. Fred Holland, Engineer and Architect to the Board, 11, Parkinson's Chambers, Hustlergate, Bradford (Tel. No. 1,529), when particulars will be forwarded in due course. Drawings and Specifications may be seen at the Architect's Office.

Sealed Tenders, on separate Forms of Tender supplied, to be endorsed "Pump-Room," "Chimney," "Atmospheric Heating," to be delivered to the undersigned not later than 9 a.m. on Monday, the 26th day February, 1906.

The lowest of any Tender will not necessarily be accepted, and the Tender of any person or firm who does not observe the fair contracts clauses referred to in specification will not be accepted.

By order,

GEORGE M. CROWTHER,

Clerk to the Guardians.

Union Offices, 22, Manor Row, Bradford  
January 18th, 1906.

#### COUNTY BOROUGH OF WEST HARTLE- POOL.

ELECTRICITY WORKS.  
EXTENSIONS.

The Corporation are prepared to receive Tenders for the Supply and Erection of the following:—

No. 38. One 500 kw. High-speed Vertical Inverted Triple Expansion Double-acting Forced Lubrication Engine and Continuous Current Dynamo (460—520 volts) on Combined Bedplate and Switchboard with all connections complete.

Tenders will be considered only from firms who have made plant of the size and capacity mentioned above.

The General Conditions, Specifications, Drawings, and Form of Tender may be inspected and obtained from the undersigned on and after Monday, February 12th, 1906, on making a deposit of £1 for each Specification, which will be returned if a *bona fide* Tender is received in the time stated below.

Sealed Tenders, addressed to the Chairman of the Electric Lighting Committee, and endorsed "Electric Lighting Specification No. 38," must be in the hands of the Town Clerk, West Hartlepool, not later than mid-day on February 20th, 1906.

The Corporation do not bind themselves to accept the lowest or any Tender.

H. F. FRIEDERICH, M.I.C.E.,

Borough Electrical Engineer.

Electricity Works, West Hartlepool,  
February 7th, 1906.

#### BOROUGH OF PORTSMOUTH.

The CORPORATION invite Tenders for the following:—

- 1 Straight Tube type Water-Tube Boiler.
- 1 Economiser.
- Boiler Feed Pumps.
- Surface Condenser and Cooling Tower.
- 1 Triple Expansion 1,000 kw. Slow Speed Vertical Generating Set.

Alterations and additions to Switchboard.

The Specifications and Drawings with General Conditions and Form of Tender can be obtained on application to the undersigned, and a deposit of Five Guineas must accompany any such application, which, however, will be returned on receipt of a *bona fide* Tender.

Any further particulars can be obtained on application to Mr. V. G. LIRONI, M.I.M.E., A.M.I.E.E., Tramways Engineer, Engineer's Office, Vivash Road, Fratton, Portsmouth.

The Form of Tender must include a declaration that the person making the Tender pays not less than the trade union rate of wages, and observing the hours of labour and conditions recognised and in practice obtained by the trade unionists in the place or places where the Contract is executed.

Tenders must be delivered to the Town Clerk, Town Hall, Portsmouth, not later than 6 p.m. on Monday, March 5th, 1906.

The Corporation do not bind themselves to accept the lowest or any Tender.

ALEXANDER HELLARD,

Town Clerk.

Town Hall, Portsmouth,  
February 13th, 1906.

#### COUNTY BOROUGH OF WEST HAM.

TENDERS FOR SUPPLIES, &c.

The Council hereby invite TENDERS for the Supply of—

- 1. INCANDESCENT LAMPS.
- 2. CABLE.
- 3. SINGLE AND TWO-PHASE ALTERNATING CURRENT MOTORS.
- 4. TRANSFORMERS.
- 5. ALTERNATING CURRENT METERS.
- 6. HOUSE CUT OUT BOXES.

Forms of Tender and further particulars may be obtained, after the 16th inst., at the Borough Electrical Engineer's Office, Central Electricity Station, Tucker Street, Canning Town.

Tenders for the whole of the Contracts to be enclosed in endorsed envelopes supplied with the forms, and sent to my office not later than Ten o'clock on Friday morning, March 2nd, 1906.

The Tenders will be opened at the Town Hall, West Ham, on Friday, March 2nd, 1906, at 5.30 p.m., and persons tendering may be present if they so desire, but no guarantee is given that any information, beyond the names of persons tendering, will be read out.

The Council do not bind themselves to accept the lowest or any Tender. The Contractor will be required to enter into a bond with sureties for the due performance of the contract and no Goods, Materials, etc., will be ordered under any contract until such bond has been duly executed.

The Contractor whose Tender is accepted, and with whom a contract is entered into, will be required to pay to the whole of his workmen such rate of wages, and observe such hours of labour, as are recognised by the Workmen's Trade Unions and in force at the time of signing the contract. In the event of any breach of such agreement the Council will enforce the penalty clause in its entirety.

By order of the Council,

FRED. E. HILLEARY,

Town Clerk.

Town Hall, West Ham, E.,  
February 15th, 1906.

#### MUNICIPAL COUNCIL OF SYDNEY, N.S.W.

ELECTRICITY DEPARTMENT.

The Council is prepared to receive TENDERS for the SUPPLY and ERECTION of—

- A. BOILERS, AUTOMATIC STOKERS, PIPEWORK, &c.
- B. TURBO-ALTERNATOR, SUB-STATION MACHINERY, SWITCHBOARDS, &c.

Specifications, Plans, and Form of Tender may be obtained on application to Mr. T. ROOKE, at the offices of Messrs. Preece and Cardew, 8, Queen Anne's Gate, Westminster, on and after Monday, February 12th.

A deposit of Five Guineas will be required on application, which will be refunded on receipt of a *bona fide* Tender as directed, and a cash deposit or marked cheque for the sum of £1,000 will be required when the Tender is sent in.

Sealed Tenders, endorsed "Tender for Electric Lighting Plant," are to be addressed to the Town Clerk, Town Hall, Sydney, and must be delivered at the Town Hall on or before 4 p.m. Monday, May 7th, 1906.

The Council does not bind itself to accept the lowest or any Tender.

(Signed) THOMAS H. NESBITT,  
Town Clerk.



# PAGE'S WEEKLY

## Contracts and Appointments Open

### TO ROOF CONTRACTORS.

### THE DIRECTORS OF THE SHEFFIELD

United Gas Light Company invite TENDERS for the SUPPLY and ERECTION at their Neepsend Station of a STEEL ROOF, 263 ft. long by about 57 ft. span, together with the RAISING of the TWO existing SIDE SPANS, one of which is 263 ft. long by 19 ft. 10 in. and the other 145 ft. long by 19 ft. 6 in., the whole forming part of the roof over the No. 2 Retort House.

Drawings may be seen, and Bill of Quantities, with Specification and Form of Tender obtained upon application to the Company's Engineer, Mr. JOHN W. MORRISON, Commercial Street, on and after Monday, February 19th.

The Directors do not bind themselves to accept the lowest or any Tender.

Sealed Tenders, endorsed "Tender for Roof," must be delivered by post to the undersigned not later than the first post on Tuesday, the 6th day of March.

HANBURY THOMAS,  
General Manager and Secretary.

Commercial Street, Sheffield,  
February 14th, 1906.

### ILFORD URBAN DISTRICT COUNCIL. ANNUAL CONTRACTS.

#### ELECTRICITY DEPARTMENT.

The above Council is prepared to receive TENDERS for the supply of the following required during the year ending 31st March, 1907:—

1. ELECTRICITY METERS and DEMAND INDICATORS.
2. CABLES.
3. INCANDESCENT LAMPS.
4. ARC LAMP CARBONS.
5. HOUSE SERVICE FUSE BOXES.

Forms of Tender, Conditions, and full particulars, may be had on application to Mr. A. H. SHAW, M.I.E.E., Electricity Department, Ley Street, Ilford, Essex.

Sealed Tenders, endorsed "Tender for ....." as the case may be, addressed to the Chairman of the Council, must be delivered to the undersigned on or before Monday, the 26th day of February, 1906.

The Council does not bind itself to accept the lowest or any Tender.

JOHN W. BENTON,  
Clerk to the Council.

Town Hall, Ilford, Essex,  
February 13th, 1906.

### COUNTY BOROUGH OF SUNDERLAND ELECTRICITY DEPARTMENT.

TO MANUFACTURERS OF FEED PUMPS, COOLING TOWERS, AND SURFACE CONDENSERS.

The Corporation of Sunderland are prepared to receive TENDERS for the SUPPLY of—

- (a) ONE BOILER FEED PUMP.
- (b) ONE WOODEN COOLING TOWER.
- (c) ONE SURFACE CONDENSER with Motor-Driven Pumps.
- (d) COAL BUNKERS, GANTRY, and other Steelwork.

The Specifications and Forms of Tender can be obtained on application to the Borough Electrical Engineer, Mr. J. F. C. Snell, M.Inst.C.E., at his office, Town Hall, Sunderland, and on payment of £1 1s. (One Guinea) for each Specification, which will be returned on receipt of a bona fide Tender.

Sealed Tenders, addressed to the "Chairman of the Electricity and Lighting Committee," Town Hall, Sunderland, must be delivered at my office not later than 12 o'clock noon on Friday, the second day of March, 1906. Tenders to be endorsed "A, B, C, or D," according to item tendered for.

The Corporation do not bind themselves to accept the lowest or any Tender.

FRAS. M. BOWEY,  
Town Clerk.

Town Hall, Sunderland, January 22nd, 1906.

### NOTICE TO CONTRACTORS.

The CAVAN COUNTY COUNCIL invite TENDERS for a STEAM TRACTION ENGINE, the Specification for which may be obtained from the County Surveyor, Atbara, Cavan.

Tenders will be received on or before the 24th inst., and are to be addressed to "The Chairman, Co. Council, Cavan."

### APPOINTMENTS OPEN.

### INDIAN PUBLIC WORKS DEPARTMENT.

The Secretary of State for India in Council will, in the Summer of 1906, make not less than TEN APPOINTMENTS of ASSISTANT ENGINEER in the Permanent Establishment of the Indian Public Works Department, in addition to the appointments to be made from Cooper's Hill College.

The age of Candidates must not be less than 21, or more than 24 years on the 1st July, 1906.

A printed Form of Application, together with information regarding the conditions of the appointments and certain requirements laid down as to education and experience in engineering, may be obtained from the Secretary, Public Department, India Office, Whitehall, London, S.W.

The Form of Application is to be returned so as to reach him not later than Tuesday, 1st May next.

A. GODLEY,  
Under Secretary of State.

India Office, December 19th, 1905.

### ARMSTRONG COLLEGE, NEWCASTLE-UPON-TYNE.

The Council will shortly proceed to the appointment of a PROFESSOR of ELECTRICAL ENGINEERING. Stipend, £500 per annum and one-third of fees until £750 in all is reached. Candidates must send in four copies of their application and testimonials, not later than March 1st, to the undersigned, from whom further particulars may be obtained.

F. H. PRUEN, Secretary.

### STAFFORD RURAL DISTRICT COUNCIL. CLERK OF WORKS.

The Rural District Council of Stafford require the services of a CLERK OF THE WORKS, to act under the instructions of their Engineers, Messrs. R. E. W. BERRINGTON AND SON, during the construction of Sewerage Works for the Parishes of Tillington and Castle Church.

Candidates must have had previous experience in similar work, and be capable of taking and giving levels, measuring up work, etc.

Salary, £3 per week; duration of contract about nine months.

Applications, in candidate's own handwriting, stating age and experience, and enclosing copies of not more than two recent testimonials, are to be sent to me, the undersigned, endorsed "Clerk of Works," on or before March 1st, 1906.

Canvassing will be a disqualification.

WILLIAM MORGAN,  
Clerk to the Council.

Council Offices, 4, Martin Street, Stafford,  
January 30th, 1906.

### CIVIL SERVICE COMMISSION. FORTHCOMING EXAMINATION.

ASSISTANT EXAMINERS IN THE PATENT OFFICE (20-25), April 5th.

The date specified is the latest at which applications can be received. They must be made on forms to be obtained, with full particulars, from the Secretary, Civil Service Commission, Burlington Gardens, London, W.

### THE MADRAS RAILWAY COMPANY

REQUIRE for their Locomotive Workshops in India, the SERVICES of THREE fully qualified MEN, to fill the vacancies mentioned below.

Free passage to Madras.

Engagement for four years.

Candidates, preferably unmarried, must not be older than 30, and have a good practical knowledge of modern workshop practice, with high-speed machine tools, and possess the following qualifications:—

MILLWRIGHT FOREMAN.—He must be able to superintend the erection and maintenance of all machine tools, and be competent to make fully dimensioned rough detail drawings. Pay, 350, rising to 400 rupees per month.

ASSISTANT MACHINE SHOP FOREMAN.—He must have had a practical training and several years' experience in a modern machine shop; he must also be conversant with both piecework and premium system of payments. Pay, 275, rising to 325 rupees per month.

ASSISTANT FOUNDRY FOREMAN.—In addition to having a good knowledge of iron and brass founding, he must be sufficiently conversant with patternmaking to direct native workmen in cylinder and other work. Pay, 275 rising to 325 rupees per month.

Applications, stating age, past employments, &c., to be addressed to the Secretary, Madras Railway Company, 1, Broad Street Place, London, E.C., not later than February 26th, 1906.

February 1st, 1906.



# Buyers' Directory.

**NOTE.**—The display advertisements of the firms mentioned under each heading can be found readily by reference to the Alphabetical Index to Advertisers on pages 22 and 24.

In order to assure fair treatment to advertisers, each firm is indexed under its leading speciality, ONLY.

Advertisers who prefer, however, to be entered under two or more different sections can do so by an annual payment of 5s. for each additional section.

## Advertisers' Service Bureau.

British Advertiser Service Bureau, Queen Anne's Chambers, Westminster, S.W.

## Artesian Well Machinery.

John Z. Thom, Patricroft, Manchester.

## Band Sawing Machines.

Noble & Lund, Ltd., Felling-on-Tyne.

## Bearings (Roller).

Hyatt Roller Bearing Co., 47, Victoria Street, London S.W.

## Belting.

Binney & Son, Catherine Street, City Road, London, E.C.

Cort, Arthur, & Co., Camberwell, London, S.E.

Fleming, Birky & Goodall, Ltd., West Grove, Halifax.

Gilmour, W. & O., St. John's Hill, Edinburgh.

## Boilers.

Clayton, Son & Co., Ltd., Leeds City Boiler Works, Leeds.

Hartley & Sugden, Ltd., Halifax.

Thompson, John, Wolverhampton.

## Boilers (Water-tube).

Babcock & Wilcox, Ltd., Oriol House, Farringdon Street, London, E.C.

Stirling Boiler Co., Ltd., Motherwell, N.B.

## Bolts, Nuts, Rivets, etc.

Herbert W. Periam, Ltd., Floodgate Street Works, Birmingham.

T. D. Robinson & Co., Ltd., Derby.

## Books.

Griffin, Charles, & Co., Exeter Street, Strand, W.C.

New Zealand Mines Record, Wellington, New Zealand.

Spon, E. & F. N., 125, Strand, W.C.

## Boring Machines.

Asquith, William, Ltd., Well Road Works, Halifax.

Niles-Bement-Pond Co., 23-25, Victoria Street, London, S.W.

Noble & Lund, Ltd., Felling-on-Tyne.

Swift, George, Clarence Ironworks, Halifax.

## Cables.

Callender's Cable and Construction Co., Ltd.

## Case-Hardening Compounds.

Hy. Miller & Co., Millgarth Works, Leeds.

## Castings.

Ashmore, Benson, Pease & Co., Ltd., Stockton-on-Tees.

## Catalogues, Printing, &c.

Atlantic Press, Ltd., Weymouth Street, Manchester.

Spottiswoode Advertising Agency, Clun House, Surrey Street, Strand, W.C.

Stafford, Arthur, & Co., Denton, Manchester.

## Chucks.

Fairbanks Co., 78-80, City Road, London, E.C.

## Cisterns, Tanks, &c.

Ashmore, Benson, Pease & Co., Ltd., Stockton-on-Tees.

Clayton, Son & Co., Ltd., Hunslat, Leeds.

F. A. Keep, Juxon & Co., Barn Street, Birmingham.

## Clutches (Friction).

David Bridge & Co., Castleton Ironworks, Rochdale, Lancashire

## Condensing Plant.

Benn, Sykes, Haslingden, near Manchester.

Concentric Condenser, Ltd., 23, Northumberland Avenue, London, W.C.

Mirrlees-Watson & Co., Ltd., Glasgow

## Consulting Engineers.

Gibbs, John, & Son, 80, Juke Street, Liverpool.

G. H. Hughes, A.M.I.M.E., 19, Old Queen Street, Westminster, S.W.

Melville & Macalpine, 615, Walnut Street, Philadelphia, Pa., U.S.A.

Mount-Haes, A., M.I.Mech.E., M.I.M.E., 11, Ironmonger Lane, London, E.C.

## Continental Railway Arrangements.

Northern Railway of France.

South Eastern & Chatham Railway Co.

## Conveying and Elevating Machinery.

Adolf Bleichert & Co., Leipzig-Gohlis, Germany.

Fraser & Chalmers, Ltd., 3, London Wall Buildings, London, E.C.

Temperley Transporter Co., 72, Bishopsgate Street Within, London, E.C.

## Copper and Brass.

W. Hepton & Son, Hunslat Lane, Leeds

## Coverings (Boiler).

Magnesia Covering Ltd., Washington Station, co. Durham.

## Cranes, Travellers, Winches, etc.

Joseph Booth & Bros. Ltd., Rodley, Leeds.

Niles-Bement-Pond Co., 23-25, Victoria Street, London, S.W.

## Cranks.

Clarke's Crank & Forge Co., Ltd., Lincoln, England.

## Cutters (Milling).

Pratt & Whitney Co., 23-25, Victoria Street, London, S.W.

E. G. Wrigley & Co., Ltd., Foundry Lane Works, Soho, Birmingham.

## Destructors.

Heenan & Froude, 4, Chapel Walks, Manchester.

Horsfall Destructor Co., Ltd., Armley, Leeds.

## Dredges and Excavators.

Delange & Cie, Mce., Hoboken, near Antwerp

Rose, Downs & Thompson, Ltd., Old Foundry, Hull

## Drilling Machines.

Asquith, William, Ltd., Well Road Works, Halifax.

Niles-Bement-Pond Co., 23-25, Victoria Street, London, S.W.

Noble & Lund, Ltd., Felling-on-Tyne

Swift, George, Clarence Ironworks, Halifax.

## Economisers.

E. Green & Son, Ltd., Manchester.

## Ejectors (Pneumatic).

Hughes & Lancaster, 16, Victoria Street, London, S.W.

## Electrical Apparatus.

Allgemeine Elektrizitäts Gesellschaft, Berlin, Germany.

British Westinghouse Electric and Manufacturing Co., Ltd., Norfolk

Street, Strand, London, W.C.

Broadbent, T. W., Victoria Electrical Works, Huddersfield.

Crypto Electrical Co., 3, Tyer's Gateway, Bermondsey Street,

London, S.E.

Ebonestos Manufacturing Co., 22, Rosoman Street, London, E.C.

Gent & Co., Ltd., Faraday Works, Leicester.

Greenwood & Bailey, Ltd., Albion Works, Leeds.

India Rubber, Gutta Percha, and Telegraph Works Co., Ltd.,

Silvertown, London, E.

Johnson and Phillips, Ltd., Victoria Works, Old Charlton, Kent.

Matthews & Yates, Ltd., Swinton, Manchester.

Mix and Genest, Berlin, W., Germany.

Nalder Bros. & Thompson, 34, Queen Street, London, E.C.

New Gutta Percha Co., Ltd., Dashwood House, New Broad Street,

E.C.

Newton Brothers, Full Street, Derby.

Phoenix Dynamo Manufacturing Co., Bradford, Yorks.

Scott, E., & Mountain, Ltd., Newcastle-on-Tyne.

Turner, Atherton & Co., Ltd., Denton, Manchester.

B. Weaver & Co. (see Ebonestos Manufacturing Co.), 22, Rosomaw

Street, Clerkenwell, London, E.C.

## Engineers' Supplies.

Ablers, Ad., Whitley Bay, near Newcastle-on-Tyne.

## Engines (Gas).

Campbell Gas Engine Co., Ltd., Halifax.

Cundall, Son & Co., Ltd., Airedale Iron Works, Shipley.

## Engines (Electric Lighting).

McLaren, J. and H., Midland Engine Works, Leeds.

## Engines (Locomotive).

Baldwin Locomotive Works, Philadelphia, Pa., U.S.A.

Hunslet Engine Co., Ltd., Leeds, England.

Hudswell, Clarke & Co., Ltd., Leeds, England.

McLaren, J. & H., Midland Engine Works, Leeds.

## Engines (Stationary).

Allis-Chalmers Co., 533, Salisbury House Finsbury Circus, London,

E.C.

Fraser & Chalmers, Ltd., 3, London Wall Buildings, London, E.C.

Mirrlees Watson Co., Ltd., Glasgow.

## Engines (Traction).

Jno. Fowler & Co. (Leeds) Ltd., Steam Plough Works, Leeds.

## Engravers.

Jno. Swain & Son, Ltd., 58, Farringdon Street, London, E.C.

## Exhaust Steam Oil Separators.

Lancaster & Tonge, Ltd., Pendleton, Manchester.

## Fans, Blowers.

Capel Fan Co., 13, Moseley Street, Newcastle-on-Tyne.

Davidson & Co., Ltd., "Sirocco" Engineering Works, Belfast,

Ireland.

Gibbs, John & Son, 80, Juke Street, Liverpool.

Matthews & Yates, Ltd., Swinton, Manchester.

## Files.

Flock'or, Tomplin & Co., Ltd., Newhall Steel Works, Sheffield.

## Fire Bricks.

J. H. Sankey & Son, Ltd., Essex Wharf, Canning Town, London, F.

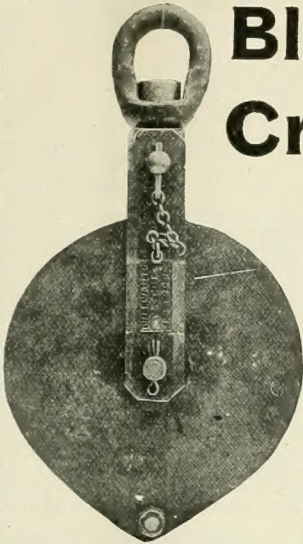
## Firewood Machinery.

M. Glover & Co., Patentees and Saw Mill Engineers, Leeds

Hill and Herbert, Ltd., Great Central Street, Leicester.



**PAGE'S WEEKLY** **Aerial Ropeways**



**Blocks, Pulleys,  
Crab Winches,  
Tackle,**

**Etc.**

Telephone No.:  
2110 Avenue.

**FLEXIBLE & SPECIAL  
EXTRA FLEXIBLE  
STEEL WIRE  
ROPES FOR  
ALL  
PURPOSES.**

**BULLIVANTS' WIRE ROPE,**  
**ABSOLUTELY RELIABLE.**  
**STEEL**  
**Blocks and Appliances.**  
**ROPE FOR CRANES, LIFTS, DERRICKS, &c.**  
**ONE-THIRD THE WEIGHT,**  
**ONE-FOURTH THE COST OF HEMP.**

**Contractors  
for  
MINING  
and  
HAULING PLANT**

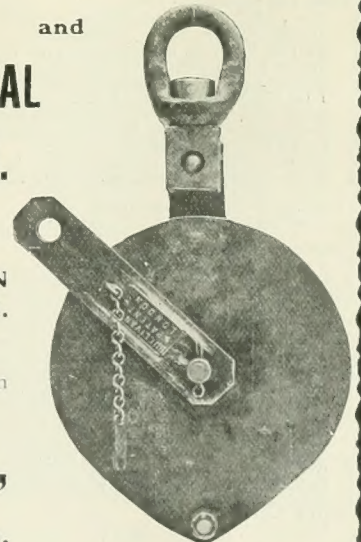
**AERIAL  
ROPEWAYS.**

**BULLIVANTS'  
PATENT COMBINATION  
GIN & SNATCH BLOCK.**

Illustrated Pamphlets may be obtained on  
Application.

**BULLIVANT & CO., LTD.,**

REGD. OFFICE:  
72, MARK LANE, LONDON, ENGLAND.





## Buyers' Directory—(Continued).

### Fountain Pens.

Mable, Todd & Bard, 93, Cheapside, London, E.C.

### Forging (Drop) Plants.

Brett's Patent Lifter Co., Ltd., Coventry.

### Forgings (Drop).

J. H. Williams & Co., Brooklyn, New York, U.S.A.

### Furnaces.

Deighton's Patent Flue & Tube Company, Vulcan Works, Pepper Road, Leeds.

Leeds Forge Co., Ltd., Leeds.

### Gauge Glasses.

J. B. Treasure & Co., Vauxhall Road, Liverpool.

Torney, J., & Sons, Aston, Birmingham.

### Gauges (Pressure, Vacuum, and Hydraulic).

Lobbie, McInnes, Ltd., 45, Bothwell Street, Glasgow.

### Gearing.

Ablers, Ad., Whitley Bay, near Newcastle-on-Tyne.

Angus, G. & Co., Ltd., Newcastle-on-Tyne.

Asquith, William, Ltd., Well Road Works, Halifax.

Dixon, W. F., & Co., 60, Percival Street, C. on-M., Manchester.

Reid Gear Co., Linwood, near Glasgow.

Wild, M. B., & Co., Argyle Street, Neshells, Birmingham.

### Gold Dredging Plant.

Fraser & Chalmers, Ltd., 3, London Wall Buildings, London, E.C.

### Greases.

Blumann and Stern, Ltd., Plough Bridge, Deptford, London, S.E.

### Hack Saws.

Baynes, Charles, Knuzden Brook, Blackburn.

### Hammers (Steam).

Davis & Primrose, Leith Ironworks, Edinburgh.

Niles-Bement Pond Co., 23-25, Victoria Street, London, S.W.

### Hoisting Machinery.

See Conveying Machinery.

### Horizontal Boring Machines.

Asquith, William, Ltd., Well Road Works, Halifax.

Greenwood & Batley, Albion Works, Leeds.

Niles-Bement Pond Co., 23-25, Victoria Street, London, S.W.

Noble & Lund, Ltd., Felling-on-Tyne.

Swift, George, Clarence Ironworks, Halifax.

### Hydraulic Leather.

Ablers, Ad., Whitley Bay, near Newcastle-on-Tyne.

### Hydraulic Machine Tools.

Niles-Bement Pond Co., 23-25, Victoria Street, London, S.W.

Vauxhall and West Hydraulic Engineering Co. Ltd., 23, College Hill, London, E.C.

### Ice-making and Refrigerating Machinery.

H. J. West & Co., 114-118, Southwark Bridge Road, London, S.E.

### Indicators.

Dobbie McInnes, Ltd., 45, Bothwell Street, Glasgow.

Hannan & Buchanan, 75, Robertson Street, Glasgow.

### Iron and Steel.

Allen, Edgar, & Co., Ltd., Imperial Steel Works, Sheffield.

Askham Bros. & Wilson, Ltd., Sheffield.

Buckley, Saml., St. Paul's Square, Birmingham.

Fairley & Sons, James, Old Mint, Shadwell Street, Birmingham.

Farnley Iron Co., Ltd., Leeds, England.

Flockton, Tompkin & Co., Ltd., Newhall Steel Works, Sheffield.

Fried. Krupp, Grusonwerk, Magdeburg-Buckau, Germany.

J. Frederick Melling, 14, Park Row, Leeds, England.

Parker Foundry Co., Derby.

Purden, John & Sons, Lambhill Forge, by Maryhill, Glasgow.

Walter Scott, Ltd., Leeds Steel Works, Leeds, England.

### Ironwork (Constructional).

F. A. Keep, Juxon & Co., Barn Street, Birmingham.

### Ironwork (Galvanised).

F. A. Keep, Juxon & Co., Barn Street, Birmingham.

### Lagging Sheets.

Zeit & Co., 21, Lime Street, London, E.C.

### Lathes.

Asquith, William, Ltd., Well Road Works, Halifax.

Bradbury & Co., Ltd., Wellington Works, Oldham.

Eclipse Tool Manufacturing Co., Linwood, near Glasgow.

Leckenby, Benton, & Co., Perseverance Ironworks, Halifax.

Mitchell, D., & Co., Ltd., Parsonage Works, Keighley.

Niles-Bement Pond Co., 23-25, Victoria Street, London, S.W.

Noble & Lund, Ltd., Felling-on-Tyne.

Northern Engineering Co. (1900), Ltd., King Cross, near Halifax.

Swift, George, Clarence Ironworks, Halifax.

### Lathe Carriers

Williams, J. H., & Co., Brooklyn, New York, U.S.A.

### Laundry Machinery.

Hill and Herbert, Ltd., Great Central Street, Leicester.

Summerscales, W., & Sons, Ltd., Engineers, Phoenix Foundry, Keighley, England.

### Lifts.

Waygood & Co., Ltd., Falmouth Road, London, S.E.

### Lubricants.

Blumann & Stern, Ltd., Plough Bridge, Deptford, London, S.E.

Reliance Lubricating Oil Co., The, 19 & 20, Water Lane, Great Tower Street, London, E.C.

### Machine Tools.

Asquith, William, Ltd., Well Road Works, Halifax.

George Addy & Co., Waverley Works, Sheffield.

Bateman's Machine Tool Co., Hunslet, Leeds.

Beanland, Perkin, & Co., School Close Works, Leeds.

Bertrams, Ltd., St. Katherine's Works, Sciennes, Edinburgh.

Bradbury & Co., Ltd., Wellington Works, Oldham.

Breuer, Schumacher & Co., Ltd., Kalk, near Cologne-on-Rhine (Germany).

Consolidated Pneumatic Tool Co., Ltd., Palace Chambers, 9, Bridge Street, Westminster, S.W.

Cunliffe & Croom, Ltd., Broughton Ironworks, Manchester.

Dean, Smith & Grace, Ltd., Keighley.

Dempster, Moore & Co., Ltd., 49, Robertson Street, Glasgow.

Fengl, A., & Co., Grafton Street, Altrincham.

Greenwood & Batley, Ltd., Leeds.

Jones & Lamson Machine Co., 97, Queen Victoria Street, London, E.C.

John Lang & Sons, Johnstone, near Glasgow.

Luke & Spencer, Ltd., Broadheath, Manchester.

Jos. C. Nicholson Tool Co., City Rd. Tool Wks., Newcastle-on-Tyne.

Niles-Bement Pond Co., 23-25, Victoria Street, London, S.W.

Noble & Lund, Ltd., Felling-on-Tyne.

Northern Engineering Co., 1900, Ltd., King Cross, near Halifax.

J. Parkinson & Son, Canal Ironworks, Shipley, Yorkshire.

C. Redman & Sons, Halifax.

Resides, 12, Aire Street, Brighouse, Yorks.

Rice & Co. (Leeds), Ltd., Leeds, England.

G. F. Smith, Ltd., South Parade, Halifax.

Swift, George, Clarence Ironworks, Halifax.

Taylor and Challen, Ltd., Derwent Foundry, Constitution Hill, Birmingham.

Vauxhall and West Hydraulic Engineering Co., Ltd., 23, College Hill, London, E.C.

H. W. Ward & Co., Lionel Street, Birmingham.

T. W. Ward, Albion Works, Sheffield.

West Hydraulic Engineering Co. (see Vauxhall and West Hydraulic Engineering Co. Ltd.), 23, College Hill, London, E.C.

Winn, Charles & Co., St. Thomas Works, Birmingham.

Yorkshire Machine Tool and Engineering Works, Liversedge, Yorks.

### Machinery Merchants.

Greenwood, Thomas, Waterside, Halifax.

### Marks.

Pryor, Edward, & Son, 68, West Street, Sheffield.

### Metals.

Delta Metal Co., Ltd., East Greenwich, London, S.E.

Magnolia Anti-Friction Metal Co., Ltd., of Great Britain, 49, Queen Victoria Street, London, E.C.

Phosphor Bronze Co., Ltd., Southwark, London, S.E.

### Metals (Perforated).

Brown, Andrew, & Co., 110, Cannon Street, London, E.C.

Meguinn, Fr., & Co., Ltd., Engineering Works, Dillingen-on-Saar.

Stanier, John, & Co., Manchester Wire Works, Manchester.

### Mining Drill Steel.

Flockton, Tompkin, & Co., Ltd., Newhall Steel Works, Sheffield.

### Office Appliances.

Davis J. Hu., & Son, Ltd., 30, All Saints' Works, Derby.

Halden & Co., J., 8, Albert Square, Manchester.

Hall & Co., E. J., 39, Victoria Street, London, S.W.

Inglesant, T., & Sons, Ltd., Atlas House, Leicester.

Lyle Co., Ltd., Harrison Street, Gray's Inn Road, London, W.C.

Rockwell-Wabash Co., Ltd., 69, Milton Street, London, E.C.

Shannon, Ltd., Ropemaker Street, London, E.C.

Trading and Manufacturing Co., Ltd., Temple Bar House, Fleet Street, London, E.C.

### Oils, &c.

Blumann and Stern, Ltd., Plough Bridge, Deptford, London, S.E.

### Oil Filters and Cabinets.

Valor Co., Ltd., Rocky Lane, Aston Cross, Birmingham.

### Packing.

Beldam Packing & Rubber Co., 93-94, Gracechurch Street, London, E.C.

Lancaster & Tonge, Ltd., Pendleton, Manchester.

Redfern & Co., S., Swan Lane, New Brown Street, Manchester.

Quaker City Rubber Co., Coronation House, Lloyd's Avenue, E.C.

United States Metallic Packing Co., Ltd., Bradford.

### Paper.

Lepard & Smiths, Ltd., 29, King Street, Covent Garden, London, W.C.

### Patent Agent.

Lorrain, J. G., M.I.E.E., M.I.Mech.E., Norfolk House, Norfolk Street, Strand, London, W.C.

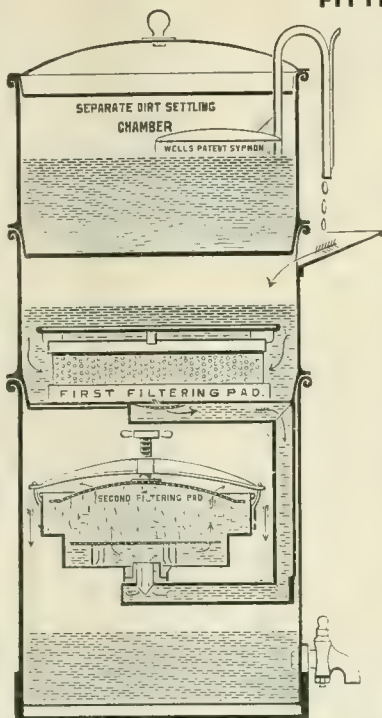


# PAGE'S WEEKLY Wells' Specialities

## WELLS' PATENT "Waste Oil" FILTERS

FITTED WITH SIGHT-FEED SYPHON.

SUPPLIED TO THE PRINCIPAL GOVERNMENTS FOR  
THE NAVY, DOCKYARDS, &c., AND TO THE LEADING  
ELECTRIC LIGHT INSTALLATIONS, ENGINEERING  
WORKS, GAS ENGINE MAKERS, PRINTERS, &c., &c.



WELLS' PATENT "WASTE OIL" FILTER.



OVER **11,000** SOLD.

**MONEY SAVERS to any  
USERS OF MACHINERY.**

Pay first cost in a short time, as Dirtied Oil,  
which has hitherto been thrown away, can  
be filtered and used again and again.

Write for List of Testimonials and Samples  
of Work done by the Filter.

- No. 1.—For users having only a small  
quantity of oil to treat (no syphon)  
17 in. by 9 in. ... 35/-
- No. 2.—Two top chambers hold about  
3 gallons oil, 22 in. by 10 in. ... 50/-
- No. 3.—Two top chambers hold about  
6 gallons oil, 27 in. by 12 in. ... 70/-
- No. 4.—Two top chambers hold about  
12 gallons oil, 36 in. by 16 in. ... 110/-
- No. 5.—Two top chambers hold about  
24 gallons oil, 43 in. by 23 in. ... 189/-
- No. 6.—Very powerful Filter for treating  
large quantities of oil, 54 in. by  
30 in. ... 336/-

Capable of dealing with **250** Galls. Oil per week.  
LARGER SIZES MADE TO ORDER.

### NO OUTSIDE POWER REQUIRED. LIME, WHITING, OR COLD WATER PAINTS,

Applied at a speed of from 8 to 10 square yards  
per minute, in a manner superior to brush work.

One coat with the Machine on rough surfaces is equal to two applied with brushes.

Will save **First Cost** in a Few Days.

- |                                 |   |          |
|---------------------------------|---|----------|
| No. 6A.                         | Small size with Detachable Rail   | £5 15s.  |
| No. 4.                          | Price, with 5 ft. Pole, Single Spraying Nozzle, and<br>20 ft. Special Armoured Hose. Capacity 6 gals.       | £8 10s.  |
| No. 4A.                         | Price, with Wheels, 5 ft. Pole, Single Spraying<br>Nozzle, and 20 ft. Special Armoured Hose.                | £9 10s.  |
| Same capacity as No. 4 Machine. |   |          |
| No. 5.                          | With 5-ft. Pole, Double spraying Nozzle, and 20 ft.<br>Special Armoured Hose, Large Size. Capacity 10 gals. | £10 10s. |
| No. 5A.                         | Ditto Ditto fitted with Wheels.   | £11 15s. |

### WELLS' IMPROVED LIMEWASH.

MUCH SUPERIOR TO ORDINARY LIMEWASH. SLAKED WITH WATER  
QUICKLY MIXED. WILL NOT RUB OFF. LEAVES A GOOD SURFACE.

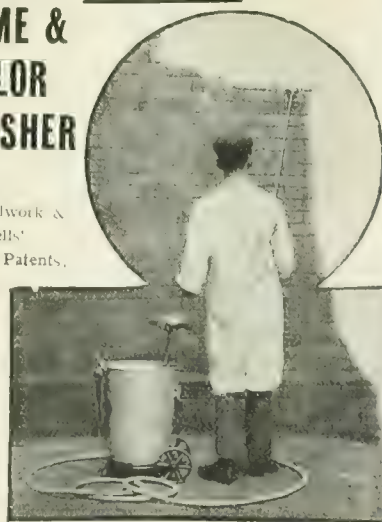
Price 13/8 per cwt.,

Carriage Paid in England and Wales, (If in lots of 3 cwt. at a  
time, 12/8 per cwt.)

**A. C. WELLS & Co.,**  
**100a, Midland Road, St. Pancras,**  
Works: Cheetham, Manchester. LONDON, N.W.

### WELLS' "LIGHTNING" LIME & COLOR WASHER

Wallwork &  
Wells'  
Patents.



No. 4a, with Wheels.



## Buyers' Directory—(Continued).

### Photo Copying Frames.

J. Halden & Co., 8, Albert Square, Manchester.  
B. J. Hall & Co., 39, Victoria Street, London, S.W.

### Photographic Apparatus.

Mason & Co., Ltd., 22 and 23, Soho Square, London, W.

### Pinch Bars.

Samson & Co., Garforth, near Leeds.

### Pipe Wrenches (Chain).

Williams, J. H., & Co., Brooklyn, New York, U.S.A.

### Pistons.

Lancaster & Tonge, Ltd., Pendleton, Manchester.

### Planished Sheets.

Zeitz & Co., 21, Lime Street, London, E.C.

### Pneumatic Tools.

Consolidated Pneumatic Tool Co., Ltd., Palace Chambers, 10, Bridge Street, Westminster, S.W.

### Porcelain.

Gustav Richter, Charlottenburg, near Berlin, Germany.

### Presses (Hydraulic).

Greenwood & Batley, Albion Works, Leeds.  
Niles-Bement-Pond Co., 23-25, Victoria Street, London, S.W.

### Publishers.

Charles Griffin & Co., Ltd., Exeter Street, Strand, London, W.C.  
Spon, E. and F. N., 125, Strand, W.C.  
New Zealand Mines Record, Wellington, New Zealand.

### Pulley Blocks.

Kramos Ltd., Locksbrook Engineering Works, Bath.

### Pumps and Pumping Machinery.

Drum Engineering Co., 33, Brook Street, Bradford.  
Enke, Carl, Schkeuditz-Leipzig, Germany.  
Fraser & Chalmers, Ltd., 3, London Wall Buildings, London, E.C.  
J. P. Hall & Sons, Ltd., Peterborough.  
Hathorn, Davey & Co., Ltd., Leeds, England.  
Positive Rotary Pumps, Ltd., 23, Northumberland Avenue, London, W.C.

### Radial Drilling Machines.

Asquith, William, Ltd., Well Road Works, Halifax.  
Greenwood & Batley, Albion Works, Leeds.  
Mitchell, D., & Co., Ltd., Parsonage Works, Keighley.  
Niles-Bement-Pond Co., 23-25, Victoria Street, London, S.W.  
Noble & Lund, Ltd., Felling-on-Tyne.  
Northern Engineering Co. (1900), Ltd., King Cross, near Halifax.  
Swift, George, Clarence Ironworks, Halifax.

### Rails.

Wm. Firth, Ltd., Leeds.

### Riveted Work.

F. A. Keep, Juxon & Co., Fore and Works, Park Street, Birmingham.

### Roller Bearings.

Hvatt Roller Bearing Co., 47, Victoria Street, London, S.W.

### Roots.

D. Anderson & Son, Ltd., Lagan Felt Works, Belfast.  
Clayton, Son & Co., Ltd., Hunslet, Leeds.  
Head, Wrightson & Co., Ltd., Thornaby-on-Tees.  
McTear & Co., Ltd., Newtownards Road, Belfast.  
Mellows & Co., Ltd., Sharncliffe.

### Ropeways (Aerial).

Buhant & Co., Ltd., 72, Mark Lane, London, E.C.  
Pohlig, J., Ltd., Cologne, Germany.

### Scientific Instruments.

Cambridge Scientific Instrument Co., Ltd., Cambridge.

### Slotting Machines.

Noble & Lund, Ltd., Felling-on-Tyne.  
Swift, George, Clarence Ironworks, Halifax.

### Spanners.

Williams, J. H., & Co., Brooklyn, New York, U.S.A.

### Stampings.

Thomas Smith & Sons, & Salford, Ltd., Birmingham.  
Williams, J. H., & Co., Brooklyn, New York, U.S.A.

### Stamps (Rubber).

Rubber Stamp Co., 1 & 2, H. Horn Buildings, Broad Street Corner, Birmingham.

### Stamps (Metal).

Edward Pryor & Son, 68, West Street, Sheffield.

### Steam Traps.

Lancaster & Tonge, Ltd., Pendleton, Manchester.

### Steam Wagons.

Thornycroft & Co., Ltd., J. I., Chiswick, London, W.  
Yorkshire Patent Steam Wagon Co., Pepper Road, Hunslet, Leeds.

### Steel Structures.

Ashmore, Benson, Pease & Co., Ltd., Stockton-on-Tees.  
Clayton, Son & Co., Ltd., Hunslet, Leeds.

### Steel Tools.

Saml. Buckley, St. Paul's Square, Birmingham.  
Pratt & Whitney Co., 23-25, Victoria Street, London, S.W.

### Steel (Tool Steel).

Fl. R. Tomlin & Co., Ltd., New and Steel Works, Sheffield.

### Stokers.

Ed. Bennis & Co., Ltd., Bolton, Lancs.

### Stone Breakers.

S. Pegg & Son, Alexander Street, Leicester.

### Superheaters.

A. Bolton & Co., 45, Deansgate, Manchester.

### Testing Machines.

Denson, Saml., & Son, Ltd., Hunslet Moor, near Leeds.

### Time Recorders.

Howard Bros., 40, Paradise Street, Liverpool, and 100b, Queen Victoria Street, London, E.C.

### Tubes.

Thomas Piggott & Co., Ltd., Spring Hill, Birmingham.  
Tubes, Ltd., Birmingham.

### Turbines.

Greenwood & Batley, Albion Works, Leeds.  
S. Howes Co., 64, Mark Lane, London, E.C.

### Typewriters.

Empire Typewriter Co., 77, Queen Victoria Street, London, E.C.  
Yost Typewriter Co., 50, Holborn Viaduct, London, E.C.

### Valves.

Holmes & Co., W. C., Huddersfield.  
Hopkinson, J., & Co., Ltd., Britannia Works, Huddersfield.  
Hunt & Milton, Crown Press Works, Oage Street, North Birmingham.  
Scotch and Irish Oxygen Co., Ltd., Rosehill Works, Glasgow.  
Shaw, Joseph, Albert Works, Huddersfield.  
Wian, Charles & Co., St. Thomas Works, Birmingham.

### Ventilating Appliances.

Matthews & Yates, Ltd., Swinton, Manchester.

### Water Softeners and Purifiers.

Lassen & Hunt, 72, Queen Victoria Street, London, E.C.

### Wagons—Steam.

Thornycroft & Co., J. I., Ltd., Chiswick, London, W.  
Yorkshire Patent Steam Wagon Co., Pepper Road, Hunslet, Leeds.

### Weighing Apparatus.

W. & T. Avery, Ltd., S. Ho Foundry, Birmingham, England.  
Denison, Saml., & Son, Ltd., Hunslet Moor, near Leeds.

### Wells Light.

A. C. Wells & Co., 100A, Midland Road, St. Pancras, London, N.W.

### Wire Ropes.

Bullivant & Co., Ltd., 72, Mark Lane, London, E.C.

### Wire Working Machinery.

Ed. Brand, 34, Shakespeare Street, Manchester.

### "Woodite."

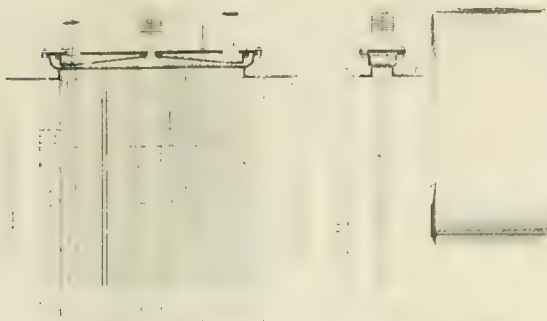
"Woodite" Company, Mitcham, Surrey.



# PAGE'S WEEKLY

## Miscellaneous

### TO STEAM USERS.



#### OVER 400 WORKING,

Averaging a saving of 15 per cent. of coal and 30 per cent. of water. Repeat Orders coming in.

#### RELIEVE YOUR BOILERS.

Increase the efficiency of your Engines and improve Production by placing BOLTON'S SUPERHEATER in the Back or Downtake Flue.

To Dry and Superheat the Steam.

For Particulars write to Patentees and Sole Makers—

**A. BOLTON & CO.,**

Engineers and Contractors,

49, Deansgate, MANCHESTER.

## YOST

THE TYPEWRITER FOR BEAUTIFUL WORK.

Catalogue on Application.

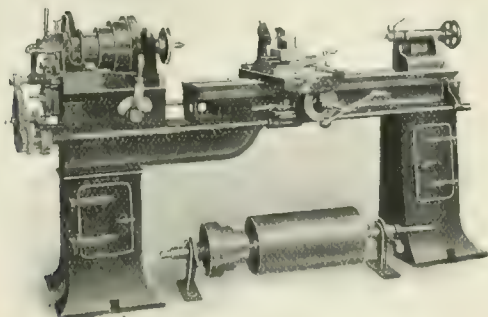
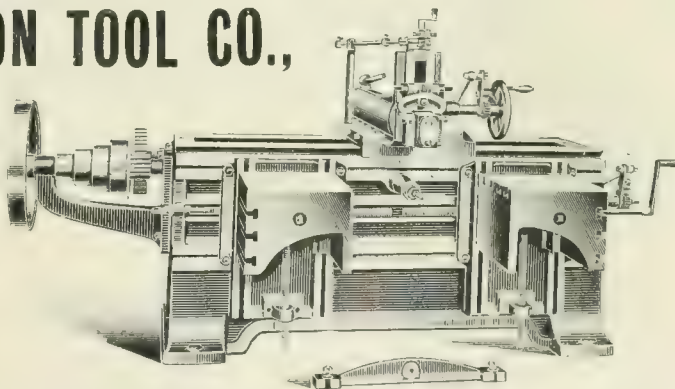
THE YOST TYPEWRITER CO., Ltd.,  
50, Holborn Viaduct, London.

### The JOS. C. NICHOLSON TOOL CO.,

Engineers & Machine Tool Makers,  
CITY ROAD, NEWCASTLE-ON-TYNE.

### SHAPING MACHINES.

Nine sizes, 8-in. to 24-in. strokes, strongly proportioned Solid Beds, Indexed Ram with central action. Tool Box fitted with long slide for down cutting, angular planing, &c.



6 1/2-in Centre Lathe for High-speed Steel.

### High-Speed Lathes,

UP TO 12 IN. CENTRE.

#### OUR SPECIALITY.

The fast headstock of machine illustrated is of new design arranged to admit large cone and wheels. The cone has special oiling arrangement.

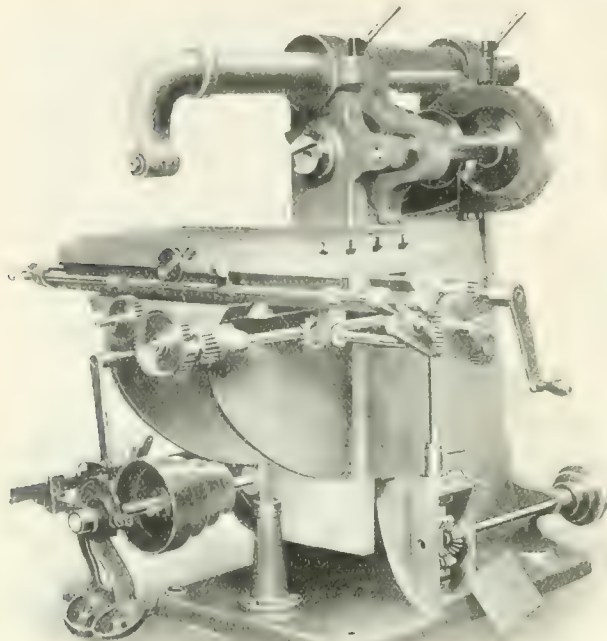
Send for Particulars and Prices to

**LECKENBY, BENTON & CO.,**  
Perseverance Ironworks, HALIFAX.



# PAGE'S WEEKLY

## Machine Tools



### Geared Milling Machines

For Milling at High Speeds

With **RAPID RETURN OF TABLE**

By Rack and Pinion.

Automatic Traverses of Table :

21 inches transversely.

7½ inches longitudinally.

With reverse motions to both feeds.

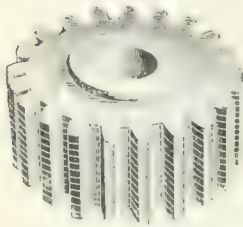
Size of Table : 2 ft. 5 in. and 1 ft. 3 in.

**CUNLIFFE & CROOM,**  
Broughton Lane, **LTD.**  
**MANCHESTER,**

Code Word : "BROOK."

**ENGLAND.**

### DIXON'S BUFFALO-RAW-HIDE GEAR PINIONS and WHEELS.



Our process is unlike any other, and may be justly termed a **Triple Hydrogen** compressed method, extracting all superfluous matter, and finishing the block one solid mass of Pure Hide.

**SILENT.**

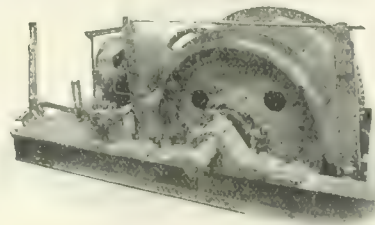
Unapproached in Quality.

**W. L. DIXON & CO.,**

60, Percival Street, C-on-M., MANCHESTER.

Contractors to the War Office, Royal Mint Dockyards, etc

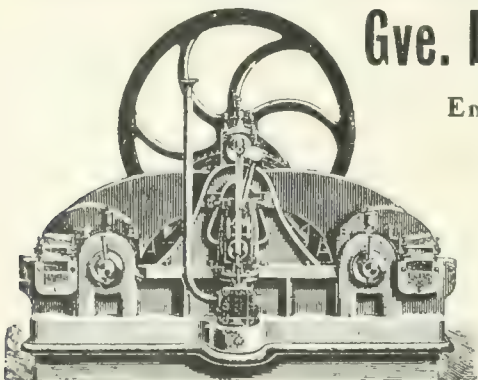
### Electric Hauling **GEARS**



Main and Tail  
Main Rope,  
Endless  
Rope,  
and  
Portable,  
Hoisting,  
and Hauling  
Gears.

**M. B. WILD & CO.,**  
BIRMINGHAM.

ARGYLE STREET,  
NECHELLS,



### Gve. DETOMBAY, Mce. DELANGE & Cie.

Engineering Works, HOBOKEN, near ANTWERP.

SPECIALITIES : APPLIANCES FOR PUBLIC WORKS :—  
Dredgers. — Elevators. — Excavators. — Tugs. — Centrifugal  
Pumps.—Sand Pumps.—Ballast Barges.—Lighters.—Yachts.—  
Hand, Steam and Hydraulic Cranes.—Drawbridges.—Pontoons.  
—Derricks.—Hand and Steam Winches.—Steam Engines.—  
Traction Engines.—Plant for Blast Furnaces.—Steel Works,  
Rolling Mills.—Gasholders.—Steam Hammers.—Shearing and  
Plate-edge Planing Machinery, &c.

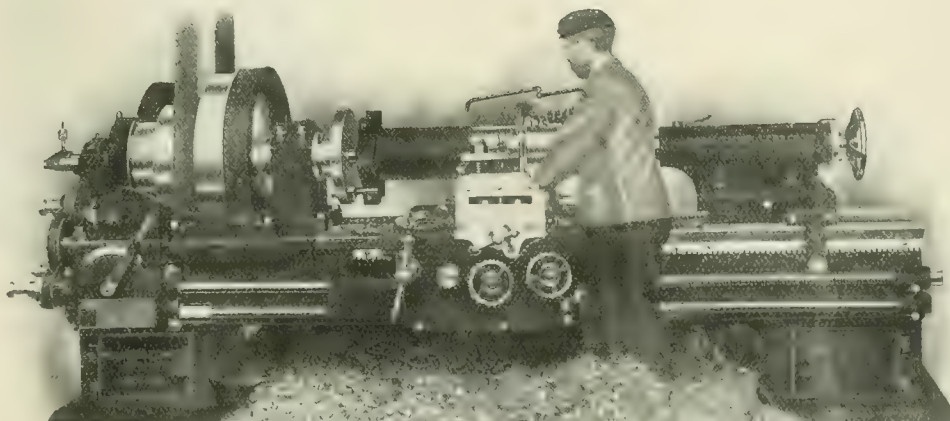


PAGE'S WEEKLY Machine Tools

# DEAN, SMITH & GRACE, L<sup>TD.</sup>

KEIGHLEY. Established 1865.

INDICATIONS POINT TO A VERY BUSY TIME AHEAD.  
ARE YOU PREPARED FOR IT?



12-in. High Speed Lathe at work on Steel Forgings  
at 80 ft. per minute.

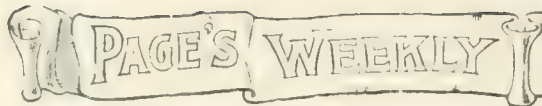
*If not write at once for our Lathe Catalogue.*

**WE CAN PUT YOU ON THE MOST ECONOMICAL  
FOOTING, AND INCREASE YOUR PRODUCTION.**

**There is no time like the present. Write now.**

Agents for London: BUCK & HICKMAN, Ltd., Whitechapel, E.  
Agent for France: LOUIS BESSE, 39, Rue de Lappe, Paris.





## Machine Tools

# GEORGE SWIFT,

Clarence Ironworks, Halifax, Eng.

Contractor to H.M. Government.

Telegrams :  
"Swiftly, Halifax."

Nat. Telephone : No. 497.

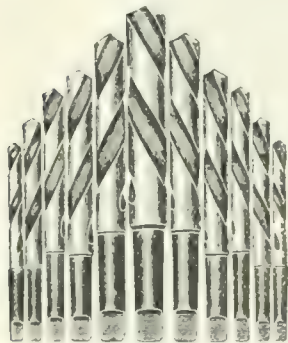
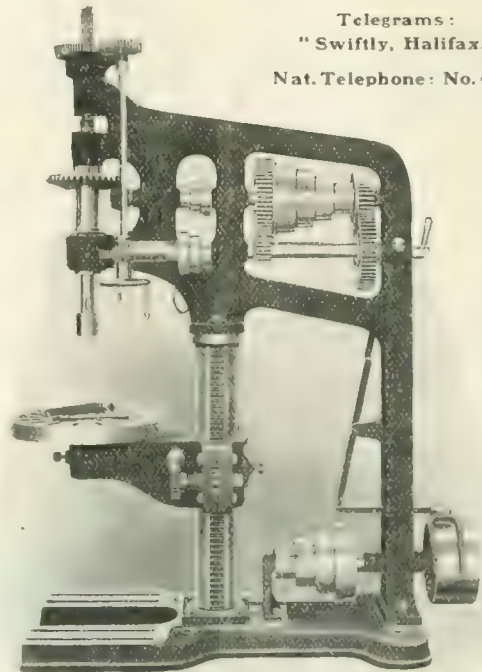
I am, and have been the leading maker of this type of Drilling Machine for a considerable number of years, and challenge any other firm to offer an equal tool at the same price, taking output and quality into consideration. Over 3,850 machines sold.

Illustration of my **30 in. Double Geared Pillar Drilling Machine No. 1**, which will bore  $1\frac{1}{2}$  in. dia. holes,  $3\frac{1}{4}$  in. deep, in any hard C.I. blocks in 30 seconds under ordinary conditions. Other features are : Spindles bored Morse Taper ; have ball thrust ; considerably more power in my machines than other makes ; all cones and gears properly balanced ; all wheels (except bevels) machine cut. The cheapest machines on the market, taking quality into consideration.

Made in 9 sizes, from **24 in.** to **50 in.**

Also made with Compound Table, Balanced Spindle, Quick Release, and Reversing Motion.

**FULL PARTICULARS ON REQUEST.**

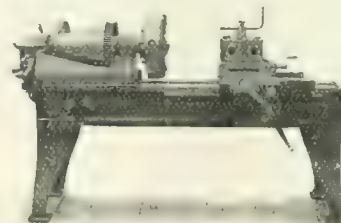


Twist Drills,  
Taps,  
Milling Cutters,  
Reamers.

**H. F. SCHNICKE,**  
CHEMNITZ (Saxony).

## HIGH SPEED LATHES

OUR SPECIALITY.



**HIGH-GRADE  
MACHINES**  
only, in stock for  
Immediate  
Delivery.

(Established 1871.)

**C. REDMAN & SONS,** Parkinson Lane, HALIFAX.

Telegrams : "MILLINO. SHEFFIELD." For the Latest and most Up-to-Date  
National Telephone No. : 985.



PLATE BENDING MACHINE.

# HEAVY- = MACHINE TOOLS = =

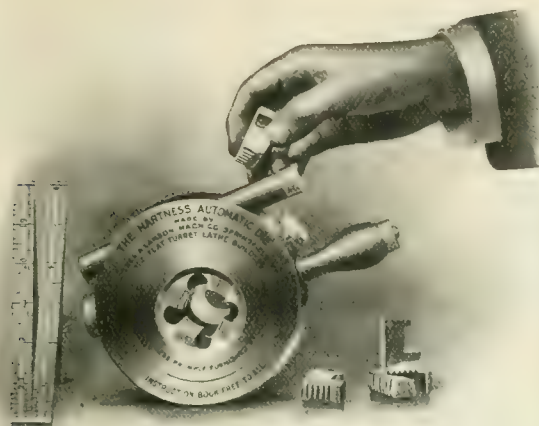
Also Special Lifting Jack for Electric  
Tramcars.

WRITE . .  
**GEORGE ADDY & Co.,**  
WAVERLEY WORKS, SHEFFIELD.



# PAGE'S WEEKLY

## Machine Tools



### Hartness Automatic Die

*The most satisfactory means yet devised for the production of screw threads.*



HIS Die is not only used on all Hartness Flat Turret Lathes, but is now working on nearly all other makes of Turret Lathes. The new No. 4 is admirably suited to Automatic Machines.

Cam takes bearing direct on back of Chasers, insuring almost perfect lead.

Chasers can be instantly changed.

The adjustment is the easiest of any Die on the market.

All regular Chasers (or Screwing Dies), together with many special and Acme sizes, kept constantly in stock.



Write to-day, giving particulars of your requirements to

## JONES & LAMSON MACHINE CO.

"Jubilee Buildings," 97, Queen Victoria Street,

### LONDON.

Telegrams: "Turretorum, London."

Telephone No. 824 Bank, London.

GLASGOW: 129, Trongate.



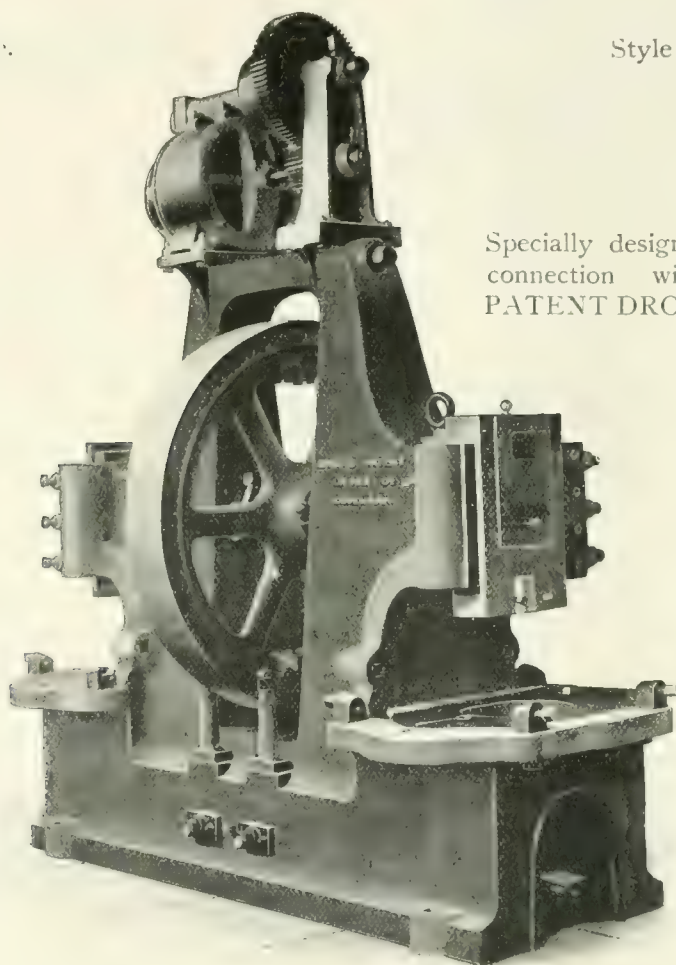
# PAGE'S WEEKLY Machine Tools

## BRETT'S PATENT DUPLEX POWER PRESS.

Arranged for Direct Motor Drive.

No. 6 Size.

Style A.D.



Specially designed to work in connection with BRETT'S PATENT DROP HAMMERS.

Made in six different sizes, Duplex or Single-ended type.

*Prices and particulars on application to*

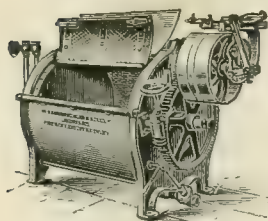
**BRETT'S PATENT LIFTER CO., LTD.,  
COVENTRY, ENG.**

Telephone: 284.

Tel. Address:  
"LIFTER, COVENTRY."



# PAGE'S WEEKLY Machine Tools, &c.



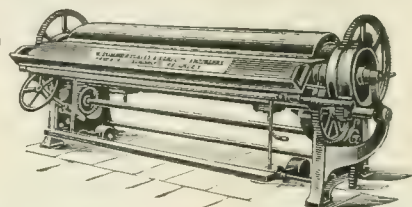
## LAUNDRY

MACHINERY

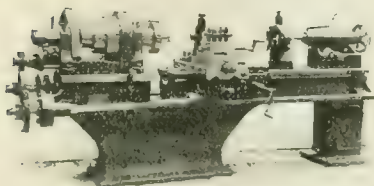
and Steam COOKING APPARATUS.

Please write for our New Catalogue, N.

Summerscales, Ltd., KEIGHLEY, ENGLAND.



## HIGH-CLASS LATHES & RADIAL DRILLS.



Write for our Lists.

Telegrams:  
"Tools, Keighley."

D. MITCHELL & CO., Ltd., Parsonage Works, KEIGHLEY.

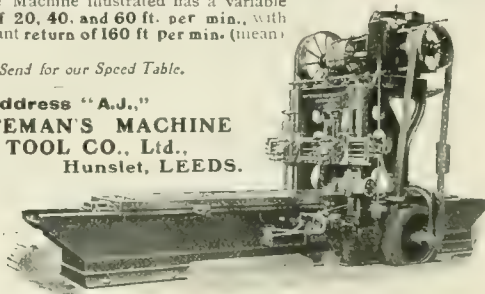
On War Office and India Office Lists.

## BATEMAN THREE-SPEED PLANERS

The Machine illustrated has a variable cut of 20, 40, and 60 ft. per min., with constant return of 160 ft. per min. (mean)

Send for our Speed Table.

Address "A.J.,"  
BATEMAN'S MACHINE  
TOOL CO., Ltd.,  
Hunslet, LEEDS.

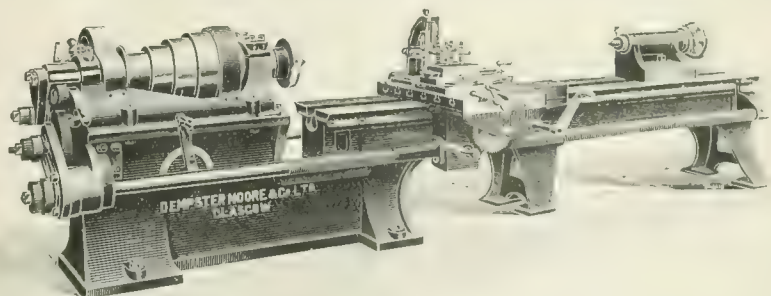


30 in. X 36 in. X 12 ft., with three-speed gear box.

## Dempster, Moore & Co., Limited, ENGINEERS, GLASGOW.

Modern Machine Tools of all Kinds.

SPECIALITY—LATHES FOR HIGH-SPEED CUTTING.



From a Photograph of a 9½-inch High-Speed Lathe.



# PAGE'S WEEKLY Friction Clutches

## HEYWOOD & BRIDGE'S Patent Friction Clutches

(30,000 HORSE POWER SUPPLIED IN ONE YEAR.)

**A CLUTCH FOR ANY DRIVE.**

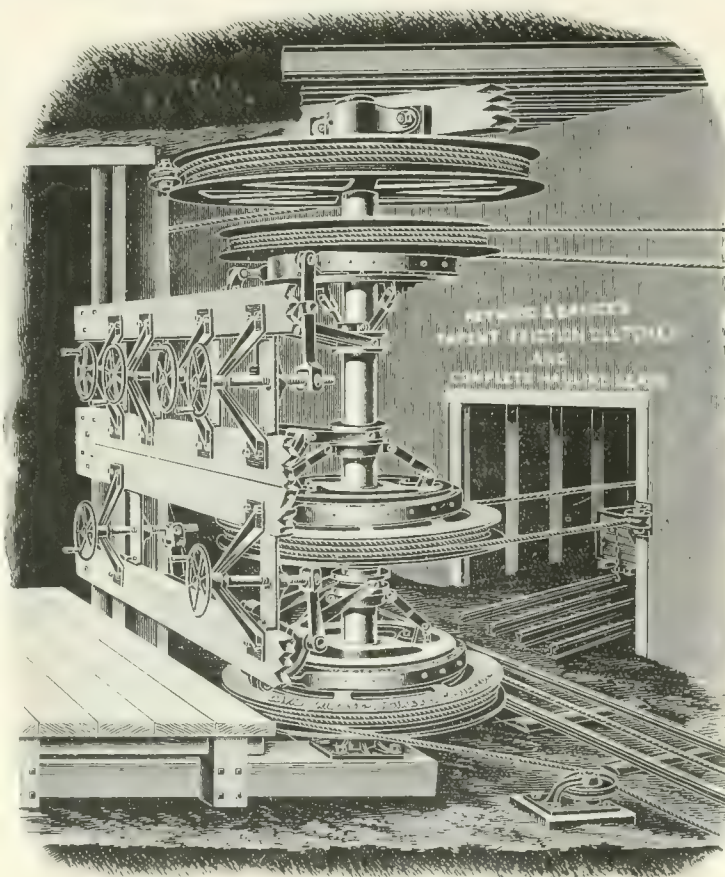
Any Speed.

Any Power

Prevents  
Accidents.

No  
End-thrust.

Stops and  
starts  
gradually,  
without any  
shock or  
jar when  
running at  
full speed.



Thousands  
Working.

Hundreds  
of  
repeat orders.

One firm alone  
has had over  
200 Clutches,  
and they are  
still placing  
orders with  
us.

As supplied to the leading Collieries, Goldfields, etc.

## COMPLETE HAULING & GEARING PLANTS.

Send for 200 page Catalogue FREE.

PATENTEES AND SOLE MAKERS—

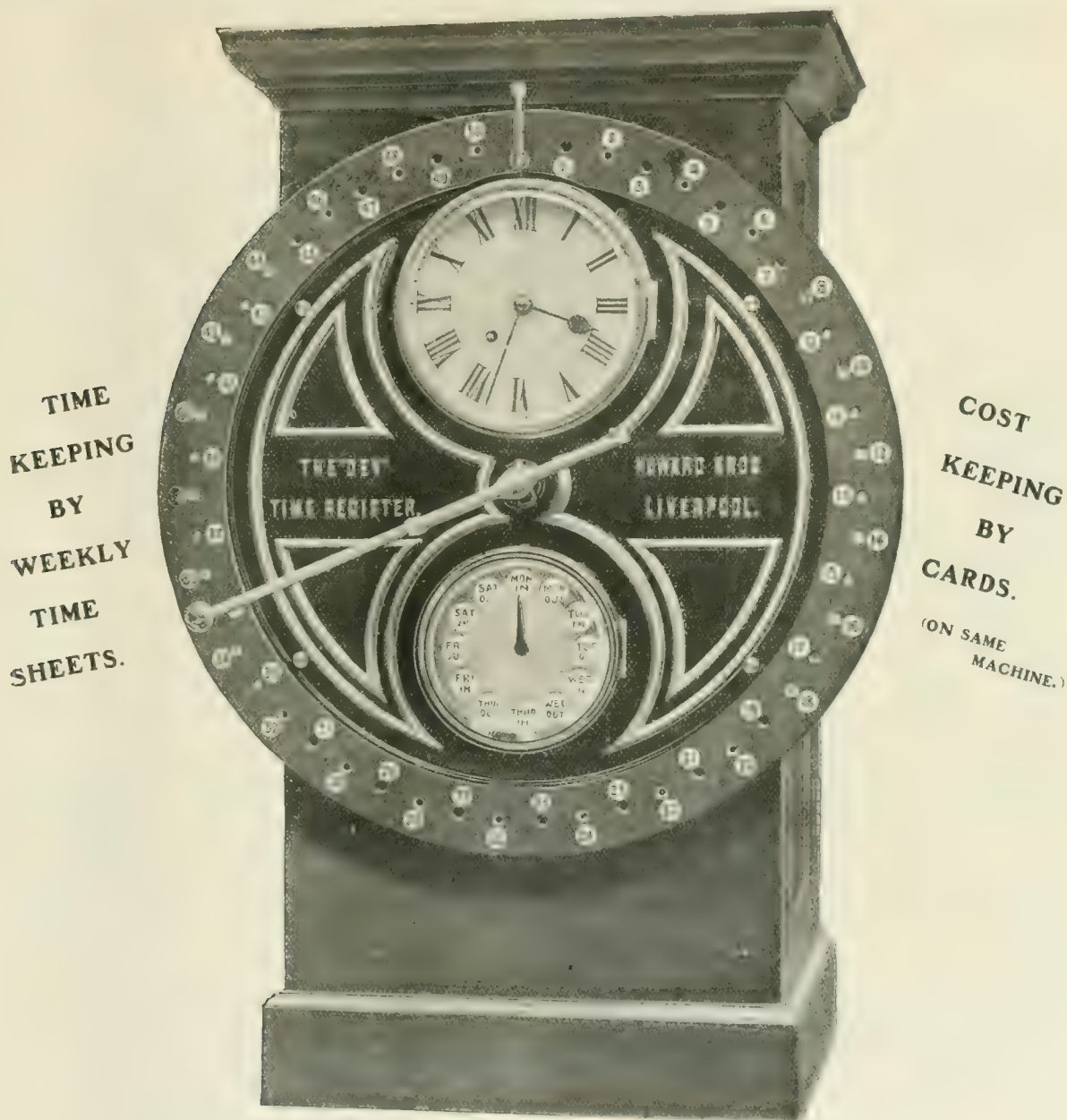
## DAVID BRIDGE & Co.,

Castleton Iron Works, **ROCHDALE, Lancs.**



**PAGE'S WEEKLY** Time Recorders

***Indispensable to Employers of Labour.***



**THE "DEY" TIME REGISTER.**

**HOWARD BROS.,** Proprietors and Manufacturers,  
**100b, Queen Victoria Street, LONDON, E.C.**

Head Office. **40, Paradise Street, LIVERPOOL.**



# Index to Advertisers.

Advertisements not appearing this week will be found by reference to the preceding or following issues, with the exception of those appearing monthly.

	PAGE		PAGE		PAGE
Addy, George & Co. ....	19	Calender Cable Con. Co., Ltd. ....	—	Electric Traction & Co., Ltd. ....	—
Ahlert, Ad. ....	2	Cambridge Scientific Instrument Co., Ltd. ....	—	Fowler John & Co (Leeds) Ltd. ....	28
Allen, Edgar, & Co., Ltd. ....	—	Campbell Gas Engine Co. ....	25	Fraser & Chalmers, Ltd. ....	—
Allgemeine Elektricitäts Gesellschaft	—	Capell Fan Co. ....	—		
Anderson & Son, Ltd., D. ....	—	Clarke's Crank & Forge Co., Ltd. ....	22	Gent & Co., Ltd. ....	—
Angus, G. & Co., Ltd. ....	Inside Front Cover	Clayton, Son, & Co., Ltd. ....	—	Gibbs, J., & Son ...	37
Ashmore, Benson, Pease & Co. ....	—	Concentric Condensers, Ltd. ....	—	Gilmour, W. & O. ....	—
Askham Bros. & Wilson, Ltd. ....	8	Consolidated Pneumatic Tool Co., Ltd. ....	27	Glover & Co., M. ....	1
Asquith, William, Ltd. ....	—	Cort, Arthur, & Co. ....	—	Green & Son, Ltd., E. ....	—
Atlanta Press ....	—	Crypto Electrical Co. ....	3	Greenwood & Batley, Ltd. ....	28
Avery, Ltd., W. & T. ....	—	Cundall, Son & Co., Ltd. ....	25	Greenwood, Thomas ....	5
		Cunliffe & Croom, Ltd. ....	14	Griffin & Co., Ltd., Charles ...	—
Babcock and Wilcox, Ltd. ....	3				
Baldwin Locomotive Works ....	28	Davidson & Co., Ltd. ....	—	Hagan's Locomotive Works ....	—
Bateman's Machine Tool Co. ....	11	Davis, John, & Son (Derby) Ltd. ....	40	Halden & Co., J. ....	—
Baynes, Charles, ....	—	Davis & Primrose ....	3	Hall & Co., B. J. ....	41
Beanland, Parkin & Co., ....	23	Dean, Smith & Grace, Ltd. ....	15	Hall & Sons, Ltd., J. P. ....	—
Beldam Packing and Rubber Co. ....	25	Deighton's Patent Flue & Tube Co., Ltd. ....	—	Hannan & Buchanan ...	—
Benn, Sykes ....	33	Delange & Cie, Mc. ....	14	Hartley & Sinden ....	—
Bennis & Co., Ltd., Ed. ....	5	Delta Metal Co., Ltd. ....	—	Hasenclever Söhne, C. W. ....	—
Bertrams, Ltd. ....	2	Dempster, Moore & Co., Ltd. ....	10	Hathorn, Davey & Co., Ltd. ....	—
Birney & Son ....	32	Denison, S., & Son ....	—	Heenan & Froude ....	—
Bleichert & Co., A. ....	—	Dixon, W. F., & Co. ....	14	Henton, W., and Son ....	24
Blummann & Stern, Ltd. ....	13	Dobbie-McInnes Ltd. ....	3	Hill and Herbert, Ltd. ....	—
Bolton & Co., A. ....	—	Drum Engineering Co. ....	—	Holmes & Co., W. C. ....	42
Booth & Bros., Ltd., Joseph ....	Inside Back Cover			Hopton, J., & Co., Ltd. ....	—
Bradbury & Co., Ltd. ....	—	Eboneston Manufacturing Co. ....	5	Horstall Destructor Co. ....	1
Brand, Ed. ....	18	Empire Typewriter Co. ....	—	Howard Bros. ....	2
Brett's Patent Litter Co., Ltd. ....	—	Enke, Carl. ....	—	Howes Co., S. ....	—
Breuer, Schumacher & Co. ....	20			Hudswell, Clarke & Co., Ltd. ....	—
Bridge & Co., David ....	—	Fairbanks Co. ....	—	Hughes & Lancaster ....	4
British Advertiser Service Bureau ...	—	Fairley & Sons, James ....	Outside Back Cover	Hughes, G. H. ....	3
British Westinghouse Electric and	—	Farnley Iron Co., Ltd. ....	—	Hunslet Engine Co. ....	—
Manufacturing Co., Ltd. ....	25	Fengli, A. & Co. ....	4	Hunt and Mitton ....	30
Broadbent, T. W. ....	30	Firth, Ltd., William ....	—	Hyatt Roller Bearing Co. ....	—
Brown, Andrew, & Co., ....	Inside Front Cover	Fleming, Birkby & Goodall, Ltd. ....	—		
Brown & May, Ltd. ....	—			India Rubber, Gutta Percha, and Telegraph	
Buckley, Samue. ....	—			Works Co., Ltd. ....	—
Bulivant & Co., Ltd. ....	—			Inglisand, T. & Sons, Ltd. ....	—

## John I. THORNYCROFT & CO., LTD.

Makers of . . . All Types of Steam and Petrol Vehicles.



WORKS: CHISWICK, SOUTHAMPTON, Basingstoke

MOTOR VEHICLE DEPT: HOGARTH LANE, CHISWICK, W.

## FORGINGS.

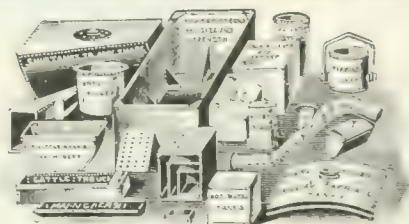
Cranks and Forgings of Every Description in Stock.

See also Advertiser's List of Manufacturers

CLARKE'S CRANK & FORGE CO., Ltd.

LINCOLN, England.

## F. A. KEEP, JUXON, & CO., Manufacturers of TANKS, CISTERNS and CONSTRUCTIONAL IRONWORK.



Forward Works, BARN STREET, BIRMINGHAM.

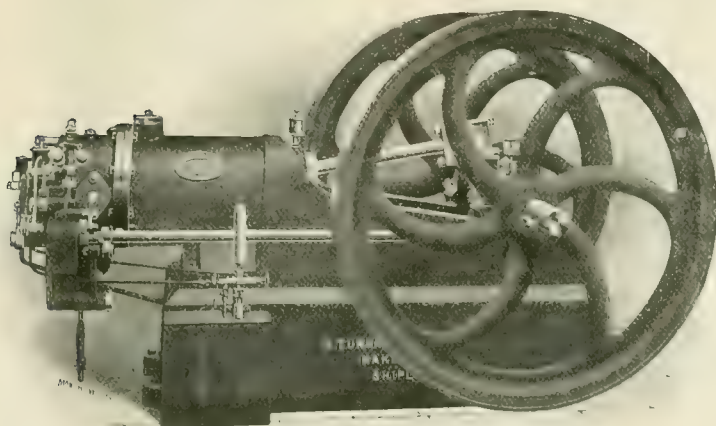




# THE "CUNDALL" PATENT OIL ENGINE,

THE MOST POPULAR OIL ENGINE.

In use in all Countries



**CUNDALL'S NEW  
SUCTION GAS  
ENGINE and GAS  
PRODUCER PLANT.**

50 h.p. costs under 5d. per hour. Larger and smaller engines at the same rate, sizes 10 to 300 h.p.

**CUNDALL, SONS, & CO., Ltd.,  
SHIPLEY, YORKS.**

Telegrams: "CUNDALL, SHIPLEY." Telephone No.: 4 SHIPLEY.

Offices and Showrooms:  
**LONDON:**  
20 & 22, St Bride Street,  
E.C.

## SOMETHING NEW.

### *How to deal with Inward Invoices.*

Does your present system involve the looking through a mass of detail before arriving at any required invoice?

If it does, then you are wasting your time.

**YOU CANNOT AFFORD TO DO THIS.**

### **THINK OF THE SAVING**

if you adopt a system that will enable you to find any required invoice at once.

**YOU OUGHT TO KNOW SOMETHING ABOUT THIS.**

PARTICULARS OF

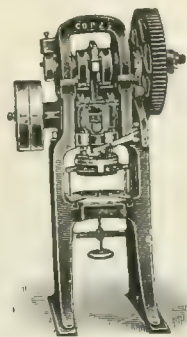
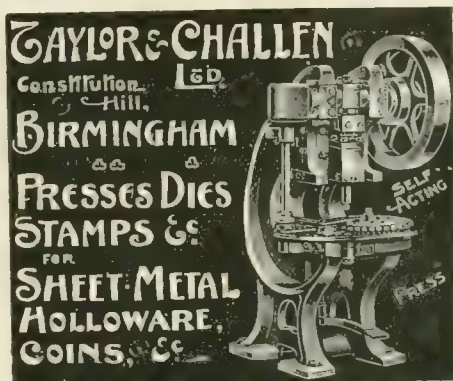
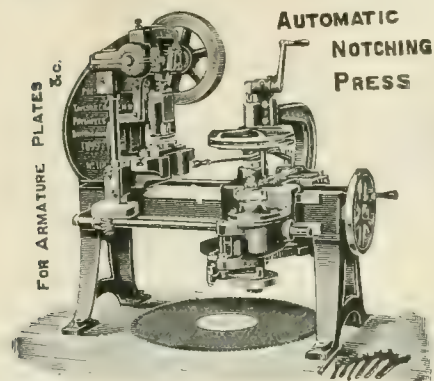
**The Trading & Manufacturing Co.,**  
C.I. DEPT., Ltd.,  
27 & 28, FLEET STREET, LONDON, E.C.





# PAGE'S WEEKLY

## Miscellaneous



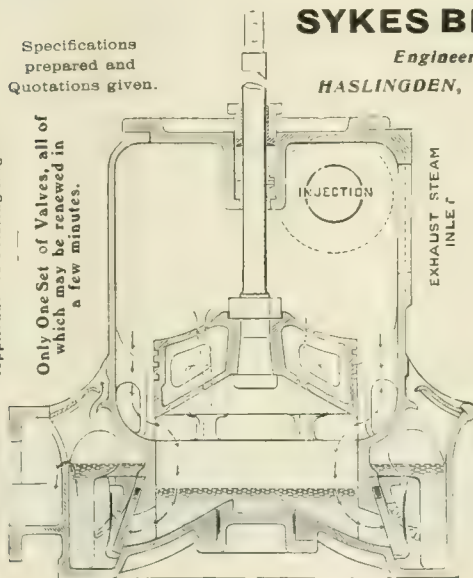
DRAWING PRESS.

**Benn's Patent Combined Air-Pump, Condenser, and Delivery Box.**

Specifications prepared and Quotations given.

**SYKES BENN,**  
Engineer,  
HASLINGDEN, LANCs.

Applicable to existing Engines  
Only One Set of Valves, all of which may be renewed in a few minutes.



For Jet, Surface or Evaporative Plants.

Steam, Electric, Rope, or Belt-Driven.

INDEPENDENT

### CONDENSING PLANTS

**"CAMPBELL"**  
GAS ENGINES & SUCTION PLANTS,  
OIL ENGINES & PUMPS.

SOLE MAKERS—

**THE CAMPBELL GAS ENGINE CO.,**

Halifax, England. Limited,

London Office—  
114, Tooley Street, S.E.

Glasgow Office—  
104, Bath Street.

**MALLEABLE IRON & STEEL**  
**CASTINGS FOR**  
**ENGINEERS & TOOL MAKERS**  
TO MACHINE CLEAN & BRIGHT  
ALL OVER.  
**PARKER FOUNDRY CO. DERBY**  
ON ADMIRALTY LIST.

## MARINE FORGINGS.

Makers of Marine and other Forgings, rough turned or finished. Tail-End Shafts, Built Rudders and Crank Shafts finished complete.

**JOHN PURDEN & SONS,** Lambhill Forge, GLASGOW.  
by Maryhill,

ON ADMIRALTY LIST.

Telegrams: "FORGINGS, GLASGOW."

Telephone: 34 MARYHILL.



## Packings, Lubricants, &c.



N.B.—If this meets the **i** of **1** who uses a spanner on his pump, engine, or compressor glands, he will hear something to his advantage about AUTOMATIC P.P.P. PACKING by communicating with—

**Ronald Trist & Co.,**  
General Managers, Ltd., United Kingdom.

4, Lloyd's Avenue,  
LONDON, E.C.

# BINNEY'S "Asblubric" Lubricants

REGISTERED TRADE MARK.

If you require **REALLY FIRST-CLASS LUBRICANTS**, or if you have any trouble with what you may be using, write to **BINNEY & SON**, stating for what purpose required, and they will be glad to forward samples for trial and full particulars of their "**ASBLUBRIC**" **LUBRICANTS**, which do not fail to give satisfaction.

also at

BIRMINGHAM, LEEDS,  
GLASGOW, and COVENTRY.

**BINNEY & SON,**  
CATHERINE STREET, CITY ROAD, **LONDON.**  
L Dept 3

# THE BELDAM PACKING AND RUBBER CO

93 & 94 GRACECHURCH ST LONDON.E.C.

SOLE AGENTS FOR THE UNITED KINGDOM & FOREIGN GOVERNMENTS, ALSO TO THE LEADING STEAMSHIP & MERCHANT COMPANIES.

TELEGRAPHIC ADDRESS: CORRUGATED, LONDON.



MARINE STEAMSHIP  
BELDAM'S RUBBER  
AND PACKING



MARINE STEAMSHIP  
BELDAM'S RUBBER  
AND PACKING



MARINE STEAMSHIP  
BELDAM'S RUBBER  
AND PACKING



MARINE STEAMSHIP  
BELDAM'S RUBBER  
AND PACKING



MARINE STEAMSHIP  
BELDAM'S RUBBER  
AND PACKING



MARINE STEAMSHIP  
BELDAM'S RUBBER  
AND PACKING

THE R.M.S. "CECILE" THE LARGEST STEAMER AFOAT IS FITTED WITH BELDAM'S SPRING NECK BUSHES & RUBBER PACKING.

WEAVERS & MANUFACTURERS OF EVERY DESCRIPTION OF ASBESTOS & RUBBER GOODS

# PAGE'S WEEKLY

**An Illustrated Weekly Journal devoted to the Engineering, Shipbuilding, Iron and Steel Trades.**

DAVIDGE PAGE, F.C.S., F.G.S., M.I.M.E., Editor.

VOL. VIII.

LONDON, FRIDAY, FEBRUARY 23, 1906

No. 76.

THE OFFICES OF "PAGE'S WEEKLY,"

*Wednesday evening.*

THE avoidance of wasteful competition is a subject that has been exercising the minds of railway managers and directors for years, but the new working arrangement between the Midland and the London and North-Western Railways must, nevertheless, be surprising to everyone who has had an opportunity of watching the struggle for supremacy which the two companies have continuously carried on. Apart from the question of needless competition in covering practically the same ground, the big railway companies have to face a steady increase in working expenses and an enormous burden in the shape of local rates. The proportion of working expenses to total receipts rose from 52 per cent. in 1889 to 62 per cent. in 1904. The amount collected in local rates rose from £2,000,000 in 1889 to £5,000,000 in 1905, and is still steadily increasing. It is not surprising therefore to find that strenuous efforts are being made to cut down unproductive expenditure. The travelling public are naturally asking themselves how they will be affected by the new arrangement. They have experienced certain advantages from competition, and would scarcely view with equanimity any reduction in the efficiency of the systems consequent upon the new scheme.

It may be pointed out that in some degree co-operation can be effected without any loss to the public. A satisfactory understanding, for instance, can prevent the running of rival trains at the same hours to the same places, and can obviate much unnecessary



*G. V. R. Magazine*

G. V. CHURCHWARD, M.I.M.E.,

whose paper on large locomotive wheels, read before the Institution of Mechanical Engineers, is reported in this issue.



overlapping in other departments. In this connection economies may be effected which should be beneficial alike to those who own railways and those who use them.

The long expected report of the Royal Commission on Trade Disputes and Trade Combinations, appointed in June, 1903, was issued on Tuesday, but is signed only by Lord Dunedin, Mr. Arthur Cohen, and Mr. Sidney Webb. Sir Godfrey Lushington and Sir William Lewis have recorded separate findings. The majority recommend that an Act should be passed for the following objects:—

- (1) To declare that unions are legal associations.
- (2) To declare strikes, from whatever motive or for whatever purposes (the union sympathetic or secondary strikes) apart from some or breach of contract legal, and to make the Act of 1871 to extend to sympathetic or secondary strikes.
- (3) To declare that to persuade to strike or to assist from working apart from some or breach of contract is not illegal.
- (4) To declare that an injury shall not be made for doing any act not in itself an actionable tort only on the ground that it is an interference with another person's trade, business, or employment.
- (5) To provide for the facultative separation of the proper benefit funds of trade unions, such separation, if effected, to carry out money from those funds being taken in execution.
- (6) To provide means whereby the central authorities of a union may protect themselves against the unauthorised and unapproved acts of their branch agents.
- (7) To provide that facultative powers be given to trade unions either (a) to become incorporated subject to proper conditions or (b) to exclude the operation of section 4 of the Trade Union Act 1871 or of some one or more of its subsections, so as to allow trade unions to enter into enforceable agreements with other persons and with their own members.
- (8) To alter the seventh section of the Conspiracy and Protection of Property Act, 1875, by repealing subsection 1 and the proviso and in lieu thereof enacting as a new subsection, which would also supersede subsection 2. — Acts in such a manner as to cause a reasonable apprehension in the mind of any person that violence will be used to him or his family, or damage be done to his property."

It is meant to the effect that an agreement or combination by two or more persons to do or procure to be done any act in contemplation or furtherance of a trade dispute shall not be the ground of a civil action, unless the agreement or combination is proved to be a conspiracy notwithstanding the terms of the Conspiracy and Protection of Property Act, 1875.

Sir Godfrey Lushington dissents, among other things, from the proposal in the report that the provident funds of trade unions should be exempt from liability. No reason is given for this but the encouragement of thrift. Thrift, he says, is a good object, but thrift comes after payment of just debts, and, certainly not least, debts incurred in consequence of wrong-doing to others. Sir William Lewis claims that the majority report is not justified by the evidence. He urges that "the beneficial effects" of the Taff Vale decision to the community generally have been emphasised by all the witnesses, and asks that, in view of the overwhelming evidence received as to the cruelty and oppression to which non-unionists are subjected at present, the practicability of devising legislation to prohibit strikes against non-unionists should be considered, in order to prevent, if possible, the existing gross infringements of the liberty of the subject.

The report of the sectional committee of the London County Council on the apprenticeship question offers further evidence of the need which exists in this country for a graduated and efficient system of technical training. As every one knows, the old-fashioned indentured apprenticeship in London is as much a thing of the past as the clubs with which the apprentices were wont to stir up strife in mediæval times. The London County Council, moreover, with all the fatherly intentions in the world, has no apparent right to pay apprenticeship premiums for any but children in industrial or reformatory schools. It can, however, co-operate with the existing apprenticeship charities

which, one is surprised to learn, reach the large figure of nearly £24,000 per annum. The essentially important part of the report, however, deals not so much with apprenticeship, as the means which may be substituted for it in the shape of evening schools, technical classes, and trade schools.

The committee has much to say on the lack of facilities for technical training in London. They cannot view with equanimity the relegation of the London-born citizen to lower positions, while better places are given to better-trained immigrants. Much has been done, and is being done, in the Council's unique organisation of evening schools to remedy this defect, but attention is directed to the crying need for day technical or trade schools. In view of the success of the Council's initial experiments, the committee suggests, among other things, that scholarships similar to those at the L.C.C. Shoreditch Technical Institute should be awarded and made tenable at some trade school in South London. It is anticipated that the inquiry among employers will show where such trade schools are most required, what trades should be taught in each locality, and the general extent of the demand for such institutions. When this has been completed, it may become possible to draw up a large scheme for scholarships and trade schools to be gradually carried out by the Council.

At the end of their report, the committee presents in a single picture the kinds of training which will take the place of the old indentured apprenticeships—a training which the Council should endeavour, as the years go by, to call into being. The boy, as he leaves the ordinary elementary school, will have offered him, provided he possesses the required ability, the choice of two distinct courses of instruction which will assure him an all-round training in a skilled trade. There will be, on the one hand, the "part-time" system in which he

will spend a portion of the week in the workshops and the remainder in the day technical school, and, on the other, there will be evening classes, which a better co-operation with the employers will render more effective and less interrupted by the working of long hours in the factory. In certain cases scholarships carrying free tuition and a maintenance grant will be awarded to the day students to compensate for the small earnings received during the years of training. Other scholarships of less value will be allowed to some of the evening students in order to encourage regularity of attendance. But it is probable that the growing interest of the employer will cause him to insist that apprentices who do not attend the day classes must be present at the evening school. From this class of student will be drawn the skilled worker of the future.

The boy, as he leaves the higher elementary school, will be able to enter the day trade school, either by paying the fees himself or by winning one of the trade scholarships which will carry with it free tuition and a maintenance grant tenable for two or for three years. With this stream of boys coming from the higher elementary school will mingle another stream of boys who, having won junior County Council scholarships and completed their course at the secondary school, have competed for one of the trade scholarships, either from choice or from inability to win an intermediate scholarship. From this class of student will be drawn the future foremen and managers of industrial undertakings. Finally, a development of the Senior County Council scholarships will make it possible, not only for the intermediate scholars, but also for certain of the holders of trade scholarships to proceed, for the highest technological instruction in the engineering, electrical, chemical, or other industries, to the University. From these will be drawn, it may be hoped, the future inventor, the future manager of large businesses, and the future "captains of industry."



## Personal Pars.

MR. J. BOBBLY DAVIS of the Illinois Barrage Association has issued a corrected report on the scheme. He recommends the site at Carysland and estimates the cost at under two millions for the barrage complete with locks, sluices, and turbines. The report contains a plan of the proposed project.

### Advertisement Rates.

### New Copy for Advertisements.

### Subscriptions, Home and Foreign.

For the United Kingdom	£1 0 0
all places abroad	£1 5 0
<b>Sample Copies, Post Free, United Kingdom</b>	<b>£0 0 6</b>
for abroad .....	<b>£0 0 9</b>

Foreign and Colonial Subscribers receiving incomplete copies of our newspapers are requested to inform us the nature and place of the defect, together with the agent's name and address.

**Offices for Publication and Advertisements,  
Clun House, Surrey Street, Strand,  
London, W.C.**

Telephone and Cable Address: SENEWY, LONDON  
 Telegrams: SENEWY, LONDON

## CONTENTS.

[illegible]

PROFESSOR JUDD, at the thirty-third annual dinner of the Royal School of Mines last week, was presented with a service of plate, an address, and an album containing the signatures of 400 of his pupils and friends in all parts of the world, as a mark of their esteem on his retirement from the office of dean of the school. In the address warm appreciation was expressed of Professor Judd's great services to geological science during his tenure of the chair of geology from 1877 to 1903, and the interest he has invariably shown in the work and welfare of his students. Professor Judd, in acknowledging the presentation, alluded to the recently published report of the Government committee, which, he said, had outlined measures that would form a basis for the reorganisation of the school as a great and flourishing institution worthy of the Empire. The wants of a technical institution were not, however, identical with those of a University, either of the ancient or modern type, and it would be a calamity if the distinctive features of their school were lost by its being drawn into the vortex of a University.

MR. WALTER MENZIES, who has gained the seat for South Lanarkshire, is the eldest son of the late James Menzies, who founded the Phoenix Tube Works at Rutherglen, Glasgow. He was engaged in the business of the firm of James Menzies and Co. until 1898, when he retired to his estate of Culcreuch, Stirlingshire.

MR. J. W. CROSSLEY, who has gained a seat in the Altrincham Division of Cheshire, is chairman of the firm of Crossley Brothers, Ltd., engineers and gas engine manufacturers. He is a member of the Cheshire County Council and a director of the Manchester Ship Canal.

MR. ALEXANDER WILKIE, labour member for Dundee, is a ship carpenter, and some thirty years ago was appointed secretary to the Clyde Society of Shipwrights, and afterwards to the Scottish Association of Shipwrights, in which position he took part in the reorganisation of local societies and the founding of the Associated Shipwrights' Society, of which he is general secretary. He was chairman of the Norwich Labour scheme in 1894 and upon the Trade Union Congress Committee had a share in instituting the General Federation of Trades. He also assisted in forming the Labour Representation Committee, and in 1902 visited America as a member of the Mosely Commission.

CAPTAIN JAMES CRAIG, member for East Down, is an associate of the Institute of Naval Architects.

## Cunard Cables.

The accompanying illustration shows several links of the huge ship's cable which Messrs. Brown, Lennox and Co., of Pontypridd, South Wales, are making for the quadruple-screw, turbine-driven steamer which Messrs. Swan, Hunter and Wigham Richardson, Ltd., are building to the order of the Cunard Steamship Company, Ltd. The iron is  $3\frac{3}{4}$  in. diameter at the smallest part of the link. Each link measures about 22½ in. in length, and weighs, with the crucible cast steel stud, about 160 lbs. Recently the Cunard Company gave notice that they required some links to be tested to destruction, and three links were cut off the cable as made and sent to Lloyd's Proving House at Netherton. The sample was first tested to the Admiralty proof strain of 180.8 tons, at which strain each link elongated not quite  $\frac{1}{4}$  of an inch. The statutory breaking strain of 205.7 tons was next applied, and the links were further elongated about



THREE LINKS FROM THE CABLE FOR NEW CUNARDER.



4 feet 6 inches. A further attempt was made to stretch the sample to its breaking point, but the pressure of the testing machine was not sufficient to accomplish the result; indeed, it was observed that the actual force applied was over 370 tons. On a careful examination of the links, no signs of fracture or defect of any kind could be found. The force applied was about 100 per cent above the A.S.M.E. limit of strain. The two main cables for the main hoist under consist of two lengths of 100 fathoms each, a total length of 200 fathoms, or 1,980 ft., in 15-fathom lengths, joined together by 22 joining shackles, and with another shackle for connecting to the rollers. The weight of the cable is 122 tons.

## The Municipal Electrical Association.

The eleventh annual convention of the Incorporated Municipal Electrical Association will be held in London during the week commencing June 18th. The Committee offers subjects from the representatives of committees and engineer members on any of the subjects stated below, or on any others to be approved by the Council, affecting municipal electrical undertakings:—"The Commercial Development of Electricity Undertakings"; "Boiler House Plant"; "Steam Turbines"; "The Depreciation of Machinery and various parts of the Equipment"; "Cable-Insulated Lamps"; "Public and Private Supply"; "Tramways."



NEW ALL-METAL DISINTEGRATOR FOR USE IN MINES, ETC.

See Page 417.

## Day and Night Telegraph Service.

The Postmaster General has received a memorial from the Secretary of the Association of Chambers of Commerce in favour of a day and night telegraph service.

General Post Office, London, E.C. 4.

February 2, 1906.

SIR, I, Postmaster General, have received the memorial which you addressed to his predecessor on November 21st last, containing a resolution of the Association of Chambers of Commerce in the United Kingdom in favour of continuing day and night and Sunday telegraphic service in all towns with more than 10,000 inhabitants, and setting forth the practice of certain foreign Administrations in respect thereof. The Postmaster General observes that the subject, which was carried at the meeting of the Association of the Chambers of Commerce was also brought forward by the Corporation of Coventry at the Association of Municipal Corporations in September last, and was then rejected by a large majority.

While, therefore, he naturally attaches great weight to the opinion of the Chambers of Commerce, he feels bound in a matter of this sort to attach special importance to the opinion of the local governing bodies of the great towns of the Kingdom, from which apart from this it appears to him that the necessity or otherwise of keeping a telegraph open continually cannot be a matter to be judged from precedent alone, but depends on the special local conditions which suggest themselves. In each town could be considered separately, on its own merits, and with regard to its own special local conditions. He fears, therefore, that he is not in a position to agree to the proposal of the Association of Chambers of Commerce. I am, Sir, most obedient servant, A. L. INNES.

The Japanese Government is meeting on Saturday, decided to put forward its scheme for the nationalisation of the Japanese railways.

Under the Director of Works' Department at Devonport Dockyard, engineering operations are sometimes having to be done in the vicinity of the 'Cremyll Shipbuilding Yard, for the purpose of ascertaining the facilities which exist for the building, repair, etc., of submarine boats, and also for providing space for the work of fitting and preparing them for active service.

# The Dockyards and the Navy.

Experiments are to be made on board the British cruiser *Iphigenia*, with a new system for the rapid laying of floating mines.

The battleship *Illustrious*, which has been repaired and re-fitted at Chatham, at a cost of nearly £80,000, was manned this week by a nucleus crew and will enter upon a series of trials.

H.M.S. *Dreadnought*, was inclined in No. 5 basin at Portsmouth on Saturday, and is to be placed in No. 13 dock to receive her armour plating. Some of the boilers are already on board; the remainder will be shipped after the armour plates are in position.

The scheme of turning the Pembroke yard into a constructive submarine depot has been finally abandoned. As it would have involved the reduction of the staff from nearly 3,000 men to some 400 to 500, much relief is felt locally.

Six submarine depôts are to be established at convenient points round the coast, each of which is to be provided with a depôt ship of high speed and a torpedo boat as tender. The whole submarine fixed mine service on the British coasts has been disestablished during the past few months, and the equipment taken over by the Navy from the military authorities, has in large part been found unserviceable. Naval officers will in future be charged with the entire responsibility for the defence afloat of our great naval bases and national harbours.

It is hoped that the dockyard extension commenced ten years ago at Keyham will be opened during the present year by H.M. the King. An area of 114 acres has been dealt with, and the total cost, including expenditure on factories, workshops, etc., will approximate to £6,000,000. So far as the contractors (Sir John Jackson and Co.) are concerned the work will be practically completed by the end of March, but the closed basin cannot be ready for use before November or December. In the meantime, however, the new battleship *Hibernia*, which is now being completed at Devonport, will be placed in No. 3 dock at the Extension Works. It is anticipated that the docking of the battleship will take place in July, and that event will for all practical purposes mark the opening of the Dockyard Extension.

The work on the new pier at Keyham, the site of the new naval base on the Firth of Forth, is making fairly rapid progress. Both the railway and the roadway being pushed on with all possible speed. The erection of the great sea wall, however, is still being delayed, owing to the soft muddy nature of the sea bottom, and it is now learned that there will be further delay. The Admiralty have decided upon making experiments by sinking a caisson before proceeding further. They issued tenders recently for the sinking of the caisson, and offers were sent in at the close of the year, but no offer has yet been accepted. The caisson is to be sunk to the depth of 100 ft. below the boulder clay in order to furnish more definite information concerning the strata than that revealed by the boring operations which are now in process.

The Senate of Glasgow University has resolved to confer the honorary degree of Doctor of Laws (LL.D.) on Mr. Robert E. Froude, F.R.S., the superintendent of Admiralty Experiment Works and member of the Admiralty Committee on Warship Designs. The honour will be formally conferred at the Spring graduation on April 17th.

The Admiralty have issued orders constituting the Electrical Engineers' supervising staff for Sheerness Dockyard, under which there is to be an assistant electrical engineer in charge, in lieu of the electrical engineer (Mr. Z. H. Kingdon) who has been selected for service at the Admiralty, and two inspectors of electrical fitters instead of one.

The cruiser *Melba*, which was built under the first arrangement with the Australian Colonies for the protection of the floating trade in Australasian waters, is to be sold by auction at Chatham at an early date as unfit for further service. She left Sheerness upwards of fifteen years ago for her first commission, and has been employed on the Australian station ever since.

Japan's new warship, the *Yasuda*, with a displacement of 13,740 tons, is to be delivered this month by the sister ship *Ikoma*, and the *Yodoko*, which is of the same type, but with a displacement of 14,000 tons and a speed of 20 knots. A new battleship of 16,000 tons and 18 knots speed is stated to be laid down at Kure. The first class battleship *Yasuda* (Springer class) has been ordered by the Navy and is now engaged upon her trials.



# Launches and Trial Trips of the Week.

4

PAGE'S WEEKLY.

FEBRUARY 23 1906.

Name of Shipbuilder.	Type	Name of Vessel.	Principal Dimensions.	Machinery.	Tonnage	L.H.P.	Estimated Speed. Knots.	Built to the order of.	Remarks.
William Duxford and Sons, Sunderland	Steel turtle-deck	<i>Diamantina</i>	38 0 ft. by 51 ft. by 28 ft.	Engines, cylinders 20 in., 43 in. and 70 in.; stroke of 48 in. Two boilers, 16 ft. by 12 ft., 180 lb. pressure. Messrs. Duxford	1,700 gross	2,200	10½	Astral Shipping Co., Ltd. (Messrs. Chadwick and Sons, Liverpool)	
Cockle Shipbuilding and Repairing Co., Gouk	Steel crew trawler	<i>Elizabeth</i>	133½ ft. by 22½ ft. by 12½ ft.	..	...	...	...	J. Mann and Son, Ltd., Fleetwood	
Str. Raydon Dixon and Co., Middlesbrough	Steel trawler	<i>Luqama</i>	43 0 ft. by 54 ft. by 25½ ft.	Two crew triple expansion engines, having cylinders 23½ in., 30 in., and 64 in. diameter by 45 in. stroke. North-Eastern Marine Engineering Co., Wallsend	5,500 dead-weight	...	...	Empire Nacional de Navegacion Vapores, Lisbon	
R. and W. Hawthorne, Leslie, and Co., Hebburn	Steel s.s. tug	<i>Clacka</i>	36 ft. 1½ in. by 34 ft. 3 in.	Triple expansion engines, cylinders 25 in., 41 in. and 68 in. by 48 in. Two single-ended boilers; pressure 180 lb. North-Eastern Marine Engineering Co., Wallsend	5,900 dead-weight	...	...	Booth Steamship Co., Liverpool	Intended to run in company with South American line.
Craig, Lashor and Co., Ltd., Stockton-on-Tees	Steel s.s. tug	<i>Logana</i>	35 ft. by 41 ft. 0 in. by 27 ft. 0 in.	Engines, 24 in., 40 in., and 65 in. by 45 in., by the North-Eastern Marine Engineering Co., Sunderland	...	...	13½	Frattelli, Genoa, Italy	Trial trip Feb. 14th.
William Gray and Co., Ltd., Hull	Steel s.s. tug	<i>Hawwood</i>	34½ ft. by 47 ft. 6 in. by 24 ft. 0 in.	Engines, 23½ in., 38 in., and 64 in. by 42 in. Two steel boilers, 180 lb. Central Marine Engine Works	7,000 dead-weight	...	...	Burrell and Son	One of the first 10 of the fleet of 20.
Robert Duncan and Co., Ltd., Port Glasgow	Steel s.s. tug	<i>Southampton</i>	37 0 ft. by 52 ft. by 28 ft.	..	...	...	...	British India Steam Navigation Co.	
Barclay, Curle and Co., Ltd., Whiteinch	Single s.s. tug	<i>Chapra</i>	43 0 ft. by 54 ft. by 34 ft.	..	...	4,000	...	David Russell and Co., Edinburgh	
A. Rodger and Co., Port Glasgow	Steel s.s. tug	<i>Craigdarlar</i>	314 ft. by 44 ft. by 23 ft. 5 in.	..	...	4,300	...	British India Steam Navigation Co.	The fifth turbine propelled steamer built by Messrs. Denny for the firm.
Denny and Bros., Dumbarton	Turbine steamer	<i>Reva</i>	455 ft. by 50 ft. by 32 ft. 9 in.	Three independent steam turbines of the Parsons type, which, together with the boilers, are being constructed by the builders	...	...	...	...	

# Our Review of the Week.

From Our Own Correspondents.

## Scotland.

### GLASGOW.

**Present Trade Tendencies.**—The steel trade is fairly well supplied with orders, and owing to the drop in the market it will be possible to secure raw materials at a lower level. The outlook suggests that there will be an improvement in the demand for steel, and although fears have been expressed as to the probability of labour troubles, it does not appear likely that the demands of the men will be pushed to the extent of bringing about a strike. The machine-tool trade reports a good business, and a feature of recent developments has been the demand for pneumatic plants for shipyard work. It will be remembered that within a comparatively recent period several foundries have remodelled their works with the object of using pneumatic tools. The firms engaged in the manufacture of gas-engines also report several important contracts, and the Oechelhauser and Koerting types of large gas-engines are growing in popularity.

**Miners' Advance of Wages.**—At a meeting of the Scottish Miners' Federation, held in Glasgow on the 16th inst., Mr. Robert Smillie (president) in the chair, it was resolved to make a demand for an increase in wages at the rate of  $12\frac{1}{2}$  per cent. The secretary was instructed to ask for a meeting of the Conciliation Board to consider the demand.

**Henderson and Co., Ltd**—There was launched from the building yard of Messrs. David and William Henderson and Co., Ltd., Partick, the twin-screw steamer *Islander*, which they have built to the order of the Christmas Island Phosphate Company, Ltd., London. This vessel, which is intended to trade between Singapore and Christmas Island, and is 230 ft. in length, 34 ft. in breadth, and 18 ft. moulded depth, is classed 100 A1 in Lloyd's Registry, and has a gross tonnage of about 1,000 tons.

**Lengthening a Ship.**—The steamship *Forth* one of the Carron fleet, running between London and Scotland for passenger and goods traffic, is at present laid up for an operation which will lengthen the boat by 40 ft. She was hoisted on a large cradle and cut right through

just forward of the bridge deck. The cradle was also sawn asunder, and the two parts, with their respective portions of the ship, were drawn apart to a distance of 40 ft. which space was then built in. The alteration will enable the *Forth* to carry about 200 tons more cargo while her steaming capabilities will not be impaired.

**Yarrow's Removal to the Clyde.**—Messrs. Yarrow and Co., of Poplar, have, after much consideration of the problem of removal, acquired land at Scotstoun, within a few miles of Glasgow, to which they intend to remove their works as soon as the necessary arrangements can be made. The reason for this step being taken has already been dealt with in this journal, but it may be added, the measured mile of the mouth of the Clyde is far more favourable for testing vessels than any other measured distance off the shores of the United Kingdom. The site of their new works extends to about 12 acres and has a river frontage of about 780 ft.

Among the obvious advantages of the site may be included the small amount of labour that will be required to make it fit for building vessels on. It will require only a little sloping towards the river, which at this particular place is already about 500 ft. in width and 20 ft. in depth at low water, while in course of time it will be still wider and deeper. The present width will be quite sufficient to allow Messrs. Yarrow to launch torpedo-boat destroyers right across the river, and thus economise space better than if their building berths had to be made at a more or less acute angle.

**Plans for the New Yard.**—The works will consist of perhaps eight berths on which small vessels may be built, a fitting-out basin, engine shops, and boiler shops. The building berths will probably be situated to the east of the yard, and the fitting-out basin to the west, with the engine shop and boiler shop to the left and right respectively of the inner end of the basin. The basin will be large enough to accommodate at least two torpedo-boat destroyers lying side by side, and it will be peculiar in at least one important respect. It will be completely rooted over, and above it there will run a cross girder carrying cranes, and capable of moving not only the length of the basin, but inland, so as to be over a half-circular line of rails connecting the engine and



boiler shops and also joining with the siding from the Lanarkshire and Dumbartonshire Railway. By this means heavy lifts can be taken from the railway outside or run from one shop to the other and can also be picked up and transferred to any part of the fitting out basin with the minimum of trouble. The new works will be begun with a view to employing from 1,000 to 1,500 men.

The site is very near to Scotstoun West Station on the Lanarkshire and Dumbartonshire Railway, and is otherwise very conveniently situated, being within easy access of the district where workmen reside. In removing to the Clyde, Messrs. Yarrow intend to continue to devote

themselves, as we have previously stated, to the building of torpedo boat destroyers, torpedo boats, Yarrow water tube boilers, and vessels of exceptional shallow draught, while they will also develop the building of small vessels propelled by internal combustion engines, a branch of the industry which they are now beginning.

**Clyde Trust Works.** The Clyde Trust is at present immediately the construction of their new engineering shops at the mouth of the Fuzzeoch. They expect to be able to transfer their works from Tolbooth to the new site about May of next year.

## North-East Coast.

### NEWCASTLE-ON-TYNE.

**Trade Report.**—There are at present about 85 mercantile vessels in "course of construction" in the Newcastle district, which is much above the recent average at this time of the year; and it is larger than any other of the shipbuilding centres of the country, except the Clyde. It points to a very large tonnage being built during the next twelve months on the river, and to work in the industry being brisk for some time to come. The steel and finished iron branches have been active. Work is plentiful, and prices firm. Steel ship plates are £7; iron ditto £7 3s., steel boiler plates £8, angles ditto £6 12s. 6d., non angles £7 3s., steel bars £7, ordinary iron bars £7 3s., all less 2½ per cent. Steel rails £6 5s. net. Other branches steady. Coke about 17s. for medium quality. The demand for pig-iron remains somewhat dull and the coal market is weak except for forward business. Producers of East-coast hematite iron are well supplied with orders, and will not accept less for mixed numbers than 70s., but second hands are offered at 69s., or even a little less. The continued increase in Connal's pig-iron leads consumers to avoid buying forward delivery. Messrs. Connal and Co., the warrant contractors, have stocked at Middlesbrough 1,000,300 tons.

**Northumberland and Durham Coals.**—During the past week best steam coals have been thrown out of gear a little through foreign steamers chartered abroad not coming to hand for loading purposes. This can be understood through the bad weather lately reported in the North Sea. The prospects are now a shade better for coal work. There is still an eagerness to sell forward,

and middle holders are hesitating accordingly. The good second classes are in a better position, and are holding well together. Small general are weaker. The War Office is now purchasing its annual requirements of steam-smithy coals, so coke for Woolwich Arsenal and the Enfield Small Arms Works. General prices will be known in the course of a day or so. The gas coal demands are fully accounted for home and overseas use. Ordinary prices are fairly quoted.

### Extension of Armstrong, Whitworth and Co.

—It is rumoured that Armstrong, Whitworth and Co. may shortly acquire another large yard on the Tyne specially suitable for building vessels of war.

### Report of the Shipwrights' Society.

The quarterly report of the Associated Shipwrights' Society, of which Mr. A. Wilkie, M.P., is general secretary, states that the world's shipbuilding output for last year amounted to 2,033,320 tons. The increased output in this country during 1905 was much greater than in foreign countries, furnishing very conclusive evidence, says the report, that protection in foreign countries has had no detrimental effect so far as this country is concerned. Employment during the quarter ending December, 1905, notwithstanding the winter months, was considerably better than the previous quarter.

### Quay-Wall Extensions.

—A special meeting of the Trade and Commerce Committee of the Newcastle Corporation was held on Monday, when it was decided that the city engineer should carry out the extensions of the quay wall. The work is not to be let on contract.

**Works Removal to the Tyne.** It is reported that the Castner-Kellner Alkali Company have decided to remove their works from Runcorn to the Tyne. The step is being taken after very careful consideration, the chief reason being the excellent supply of electricity to be obtained at a low cost on Tyneside. The site secured is at Wallsend, in close proximity to a large power station. Already the United Alkali Company have works on the Tyne.

**Commercial Dry Docks.**—At a meeting of the North-East Coast Institution of Engineers and Shipbuilders, held on the 16th inst., Mr. J. M. Moncrieff, read a paper on "Commercial Dry Docks."

In the course of the paper, Mr. Moncrieff said the first question which naturally occurred to anyone proposing to construct a dry dock for commercial purposes and as a dividend-earner was "What ought the dimensions to be?" Modern docks must, of course, show some regard to future developments, but they must also avoid the outlay of capital which may lie unproductive for a more or less extended period of time. If they took the conditions existing on the river Tyne as being fairly representative for the whole North-east Coast, they found that among all the ships cleared outwards from the river prior to December 31st, 1904, there was only one of which the net register tonnage amounted to 5,600 to 5,700 tons, or, roughly speaking, a vessel probably from 12,000 to 13,000 tons deadweight capacity, and only three vessels in all prior to the date mentioned exceeded 4,000 tons net register. Were they to expect that vessels of still greater size would form any considerable proportion of our Mercantile Navy?

**Requirements of the Tyne.**—An analysis of the figures published by the River Tyne Commissioners of the number of vessels of various tonnages making use of the river during the five years 1900-1904 shows that while the vessels comprised between the limits of 500 and under 4,000 tons net register numbered 38,054, the number of those reaching or exceeding the latter dimension was only twelve, or only a small fraction of one per cent. of the number of those of between 500 tons and 4,000 tons. Judging from these figures, it would appear that a dock of 550 ft. length by 65 ft. width of entrance, by 14 ft. depth on the sill at low water and 29 ft. at high water of ordinary spring tides could probably deal with every commercial vessel ever cleared from the river Tyne up to the end of 1904.

**Dry Docks or Floating Docks.**—Would the size of steamships increase to such an extent as to justify a commercial dock company in a large present outlay for docks of much greater dimensions than those just given?

In his view the proper line to take was to provide for some increase over present-day ordinary dimensions, as regarded width and depth, but to construct docks in such a manner that a further increase of length could be carried out at any time should there be some prospect of its being remunerative. On the question of dry docks *versus* floating docks, he combated the claim that the floating dock was less costly to construct than the dry dock. As to the second claim that a floating dock could be sent down a river or out into a harbour to meet and take on damaged vessels, he thought it could hardly be taken seriously. The whole question of whether a dry dock or a floating dock should be adopted was almost invariably subject to the special circumstances of each individual case.

**The "Drumcondra."**—By the launch from their yard recently of the turret steamer *Drumcondra*, Messrs. Doxford have to their credit three vessels launched in 43 days, aggregating 12,000 tons gross register—a most promising start for the present year. The dimensions of the *Drumcondra* are: 380 ft. length; 51 ft. breadth; 28 ft. moulded depth. The classification is with the Bureau Veritas Registry. The gross register is 4,700 tons; the draft 23 ft. Messrs. Doxford are supplying the engines, having cylinders 26 in., 43 in., and 70 in., with a stroke of 48 in.; and two boilers, 16 ft. diameter, 12 ft. long, 180 lb. pressure.

**Trial Trip of the "Martazan."**—The large steel screw steamer *Martazan*, built by R. Craggs and Sons, Ltd., Tees Dockyard, Middlesbrough, for Messrs. Henry Fernie and Sons, of Liverpool, recently proceeded to sea for her official trials, the vessel registering an average speed of twelve knots over a ten-mile course. The machinery, by Messrs. Blair and Co., Ltd., of Stockton-on-Tees, has cylinders 24 in., 40 in. by 65 in., by 45 in. stroke, steam being supplied by two large single-ended boilers, working at a pressure of 18c lb. to the square inch.

**Craig, Taylor and Co., Ltd.,** Stockton-on-Tees have built the steel screw steamer *Virginia*, to the order of Messrs. Fratelli Cosulich, Trieste. The vessel is of the following dimensions, viz., 337 ft. by 41 ft. 9 in., by 27 ft. 9 in. depth moulded. She is built of steel to the highest class in Lloyds and Austrian Veritas, under special survey with long poop, bridge, and topgallant forecabin; water ballast in double bottom fore and aft, and in peaks. She is rigged as a fore and aft schooner, and equipped with five large special steam winches, steam steering gear, steam windlass, etc. Her engines have been constructed by the North-Eastern Marine Engineering Company, Ltd., Sunderland, the cylinders being 24, 40, 60 in. by 45, with two



latent boiler to work at 15 lb. pressure, with two 12-horse-power bronze propeller, etc. and a course of six-inch four-inch an average port of knots was obtained. The owner was represented on the trial trip by Mr. James Stewart, of Trieste, and whose superintendence the vessel has been built.

**Interchangeable Guide Screw Stocks.**—Sir W. G. Armstrong, Whitworth and Co., Ltd., announce the intro-

duction of new interchangeable guide screw stocks and dies in connection with their screwing apparatus. This particular pattern, employing three dies for each different thread, cuts a thread little inferior to that produced by a good screw cutting lathe. Attention may also be directed to a special screw stock for large pipes, the dies and guides for insuring a true start being simultaneously moved towards or from the centre, the handles being detachable for compact storage.

## Yorkshire District.

### SHEFFIELD.

**The Industrial Position.** Great activity is to be noted in most branches of the steel and iron industry. Iron prices are firm, and practically the whole of the output is now going into consumption, as the finished ironmakers find the demand for bars and hoops fully up to the existing means of production, while most of the steelmakers are booked ahead with orders. There is an improving demand for best steels for high-class cutlery, tools, and instruments, and makers of high-speed qualities report that there is no falling off in the demand. A very large proportion of the output of some firms is still going to America. Steel manufacturers there have been doing their utmost to produce material equal to what is going from Sheffield, but so far without success. Tools made from the imported steel do more work in less time, and are more durable than the tools made from their own steel. For all kinds of castings for electrical, hydraulic, and engineering work there is an increasing demand, and both iron and steel foundries are better employed than they were. For certain descriptions of heavy tools there are more inquiries but at present competition is very keen. The foreign demand for railway materials is well maintained; large rolling mills are for the first time for some years fully employed, and in a few cases are even extending their plant.

**The Steel Rail Trade.**—The marked improvement in the mild steel trade has had the effect of putting up the price of hematite iron to such an extent that ordinary heavy rails could not be quoted at less than 20s. per ton, and in many cases a still higher price was quoted for rails up to 40 and 60 lb. per yard. This has been the result of making buyers hold off, and especially in cases in most cases railway companies requiring rails for new lines, or new rails for renewal of old ones, could not wait for a few months until a cheaper market came about. The first condition of a cheaper market is, of course, cheaper crude iron, and the tendency of the trade in iron during the past fortnight has been distinctly in that direction. Prices have come down from 75s.

to 65s. per ton for mixed Bessemer numbers. This will enable steel makers to quote lower price for rails, and thus it is expected that lower values for hematite will bring about new life in the rail trade. At present a large percentage of the iron manufactured is being sold for utilisation in the mild steel trade. There is a rather weaker tone in this trade at present, and probably this accounts for a shrinkage in the price of pig-iron. At any rate, the tendency of iron prices to be lower is a distinct step in the right direction, because it is a movement towards that ideal position which will make it possible not only for iron, but Bessemer and Siemens-Martin steel to be quoted at prices which will encourage an all-round active trade. The prospect is that this position will soon be realised.

**New Blast Furnaces at Staveley.**—The Staveley Coal and Iron Company are putting up three large modern blast-furnaces, the output of which will probably aggregate more than that from the whole of the furnaces the company have now in use. These, of necessity, will largely increase the consumption of coke by the company, and a large number of by-product coke-ovens of the most recent and up-to-date pattern will be installed.

### The Sheffield Forge and Rolling Company, Ltd.

—New plant is being put down by this firm which will include an up-to-date rolling mill, with a capacity of from 250 to 300 tons per week, and consisting of two three-high trains of rolls and three trains of pairs. The cost of the mill will be about £10,000, and it is anticipated that it will be in operation early in April.

**Large Casting at Jessops'.**—Visitors to the works of Messrs. William Jessop and Sons, Ltd., on Friday last witnessed the casting of a large hydraulic cylinder weighing, in the rough, over 52 tons. Two Siemens furnaces were tapped, and two ladles, each containing 20 tons of molten steel, were taken simultaneously by overhead electric cranes to the mould for the casting of a cylinder 12 ft. 10 in. high and 30 in. in diameter. This company has for a number of years devoted special attention to steel forgings and castings of all classes for ship and general engineering.

# Lancashire District.

## MANCHESTER.

**Prices and the Outlook.** There is hopeful feeling among those engaged in the iron and steel trade here, and in spite of the drop in warrants manufactured iron maintains its equilibrium. Foundries are generally brisk. At Workington there are now 38 turnaces in blast, 54 on hematite, two on ferro-manganese, one on Speigeleisen, and one on charcoal iron. Prices are somewhat nominal. Quotations for pig-iron are: Lancashire No. 3 foundry, 65s.; Lincolnshire, 62s. to 62s. 6d.; Staffordshire, 61s.; Derbyshire, 65s. to 65s. 6d.; Middlesbrough open brands, 58s. 10d. to 60s.; Scotch Gartsherrie, 67s. to 67s. 3d.; Glengarnock, 64s. 6d.; Eglinton, 64s.; and Dalmellington, 63s. 3d. delivered in Manchester. For delivery Heysham; Gartsherrie, 65s. to 65s. 3d.; Glengarnock, 62s. 3d.; Eglinton, 60s. to 62s. 3d.; Dalmellington, 61s. For delivery Preston; Gartsherrie, 66s. to 66s. 3d.; Glengarnock 63s. 6d.; Eglinton 63s.; Dalmellington, 61s. 6d. Finished iron was in request at fully late rates.

**Barrow Iron.**—The hematite iron market is inclined to weaken. Makers are still well off for orders, but new business is not coming to hand as briskly as it did. Makers quote 70s. net for mixed Bessemer numbers, but warrant sellers are at 65s. net, and buyers 60s., with very small operations reported. Stocks have gone up 400 tons, and are 1800 higher than in January. There is every probability of a further increase in stocks. Steel makers are well off for orders for ship building material, but are only doing a small trade in rails. More rail orders are expected when prices come down. Merchant steel is quiet. Ship builders are short of orders. Engineers are very busy. Coal and coke in British demand, but shipping is quiet.

**Machine Tools.**—The Newall Engineering Company, Ltd., Warrington, are building for W. Beardmore and Co., Ltd., Parkhead, one of their largest measuring machines. The company has also on order a complete equipment of limit gauges for the Shanghai-Nanking Railway, and another for screw gauges for the Admiralty. An increasing demand for screw gauges is one of the trade tendencies to be noted. Isaac Storey and Sons, Ltd., have recently carried out a number of important tests of special mixtures of manganese, copper, and bronze, and the results of these tests are awaited with a good deal of interest. Black Patent and Co.,

Ltd., are paying attention to recent developments in universal facing and boring machines, and also to a very handy special radial drill for drilling holes in positions usually inaccessible for ordinary machines. This machine has a cast-iron box bed with tee slots on the vertical and horizontal faces. On it is mounted a vertical pillar, which may be revolved. The pillar carries a vertical slide which can be raised or lowered. At right angles to the pillar a solid steel arm slides through and carries the drill, thus giving the usual facilities of a radial drill. The spindle drive is obtained by a three-speed cone on a shaft in the base, transmitting motion up the column to the rear end of the drill arm to bevel wheels, where a chain wheel is fixed. The other end carries the drill spindle, also mounted with a chain wheel. An endless chain, passing along the channels in the H section arm, gives motion to the drill spindle. The arm is 3 in. square, and a hole can be drilled within 1½ in. of any projection. The drill may be placed above or below the arm, and holes may thus be drilled upwards or downwards. Two feeds are provided to the drill by means of screw and feed-gears on the head of column.

**Cammell's and Workington Docks.** A hitch is said to have occurred in the negotiations for the transfer of the Workington Dock and Harbour Estate from Lord Lonsdale and his trustees, the owners, to Messrs. Cammell, Laird, and Co., of Workington and Sheffield. The Board refuse it is said to complete the transfer until they have received compensation for the alleged neglect to continue the work of keeping clear the harbour and channel during the period of possession since the agreement for the transfer of the estate was decided upon.

**Changes in the Virginia.** Information has been obtained that this turbine steamer is to undergo alterations in regard to its propellers it having been determined that three-bladed propellers shall take the place of the four-bladed ones now on the shafts. Of course the new propellers will naturally have increased diameter, and the number of revolutions will at the same time be reduced. A great deal of trouble has been expended in the design of the new propellers, more particularly in regard to pitch. The alteration will be a very considerable difference to the success of the boat, as edge friction will be greatly minimised by the smaller number of blades and the slower engine speed.



# The Midlands.

**BIRMINGHAM.**

**Trade Revival.** The returns concerning the output of pig-iron in the Midlands and Staffordshire evidence an anticipated revival in the pig-iron trade, notwithstanding the current weakness in the warrant market. Sixty last furnaces are returned as at work in the Midlands, fourteen in Lincolnshire, and forty in North and South Staffordshire. This is an aggregate increase on the returns of six months ago of thirteen and is considered very satisfactory. Foundry and forge pig-iron are included. Makers are now considering the advisability of blowing in further furnaces, but it is feared prices might suffer. The latest tendency points to the fact that when a large quantity of iron is being delivered, this is on account of old contracts, and that consumers are temporarily holding off in the hope of being able to place fresh orders on more favourable terms. There has been some discussion locally with regard to the high prices demanded for railway material, and some of the agents for the Colonies have been influenced in contracts which they have had to give out in view of the difference between English and American quotations. In addition to the reconstruction of Snow Hill Station referred to elsewhere, the Great Western Company is engaged in the construction of the new railway to Stratford via Henley-in-Arden.

**Wolverhampton Iron.** There is no falling off in the demand for iron and steel manufacturers as a rule are fairly well supplied with work, and in only a few instances are the men not engaged full time. Inquiries are moving at a regular rate, but buying proceeds quietly. A satisfactory tone is reported, and the outlook is as promising as of late. Home demands are well maintained, and exporters are giving out good orders. Bar iron makers hold contracts which will keep their hands going regularly throughout the quarter. Both for best and common iron there is a good call. Galvanisers are taking a large quantity of black sheets, and there is a more pronounced inquiry for the stamping and working up classes of sheets. For all kinds of structural material the demand is well upheld, and the smaller sizes of iron are going into consumption in large quantities. Red and strip iron is selling freely. There is an active demand for steel and the requirements of consumers of pig-iron are so great that smelters will not sell forward. A good trade is being done in coal.

**Re-building Snow Hill Station.** The Great Western Railway Company is to spend an approaching a million sterling on this scheme. When finished the new station will be considerably more than twice the size of the present building, and the provision of adequate platform accommodation is an important feature of the new construction. There are to be two island platforms for dealing with the increasing traffic, but as it is not possible to increase the width of the station, the additional accommodation will have to be in length. The new platforms will therefore be about a quarter of a mile long with an average width of 70 ft. The existing buildings on the Snow Hill site will be taken down and several new blocks erected on that site. The reconstruction is not being undertaken a moment too soon, the directors of the Great Western Railway having realised for a long time past that the station was quite inadequate to meet the requirements of the steadily increasing traffic. Indeed, as long as four years since, plans, since completely revised, were passed for the erection of a station of imposing dimensions. A good deal of preliminary work has already been accomplished, and some of the contracts for certain sections are now ready to be placed. The roof of the platform is not to be in one span as hitherto, but each platform is to be covered with a roof of galvanised iron and glass. New engine and carriage sheds are being erected on a site near Tysley.

**Derby Royal Show.**—The Royal Agricultural Society show at Derby bids fair to be one of the best ever held by the Society, the support already accorded necessitating a rather larger yard than was at first intended. Trials of suction gas plants will be a feature of the implement yard at the Derby Show of the Royal Agricultural Society, gold and silver medals being offered. The regulations issued show that the plant is to consist of gas generating plant and engine complete, of 15 to 20 h.p., as a maximum. Each engine must be fitted with a rope or web brake on the fly wheel, water trough in wheel for cooling, indicator cock and gear, revolution counter and explosion counter, all of which must be approved by the Society's consulting engineer. The trials are to take place during the week previous to the show, and the plants are to be exhibited in action in a special building during the show week. During the trials the engines are to run for nine hours under constant load, after which they will be shut down for the night, and will be running on the following day.

At the commencement a given quantity of coal will be weighed out to each competitor, the time of lighting up to be noted, and as soon as sufficient gas has been generated, and the engine is running at full power the time will be recorded as the commencement of the run, so far as the consumption of coal is concerned. At the conclusion of the trials, the fires will be drawn, and any unconsumed coal will be weighed back and credited for what it may be worth. The points to which special attention will be directed in these trials will be:—(1) Attendance necessary; (2) General design, including facility of cleaning, and space occupied; (3) Regularity of working; (4) Fuel and water consumption; (5) Price; (6) Relative proportion of gas producer and engine; and (7) Volume swept by piston relative to h.h.p.

**National Iron-Plate Trade Society.**—The seventeenth annual report of the National Iron-plate Trade Society has just been issued. There is now a revival in trade, and every prospect of good business for a few years. United action on the part of the workmen would raise wages. There is at present a rising market, says the report, and the employers during the last few months have put up their prices, in some cases more than 30 per cent. Up to now the men have reaped no benefit, and are worse off to-day than they have been for years. The membership has receded owing to the fact that depression in trade has made it impossible for members to continue their contributions. Proposals have been made for a superannuation scheme, and for affiliation with the tin-plate workers, but not 50 per cent. of the ballot papers have been returned.

**New Wireless Experiments.**—Three gigantic masts, 225 ft. high, are being erected by the De Forest Wireless

Telegraph Syndicate at Cambridge, Oxford, and Sherburness to demonstrate the advantages of the De Forest system. It is intended to erect a number of similar masts on suitable sites in England, Scotland, and Ireland for the transmission of wireless messages.

**German and Belgian Iron.**—Messrs. Oscar Moenich and Co. state that the characteristic of the Belgian and German iron and steel markets is still great unevenness; half the works have sold out their production for the next three or four months, in many cases at low prices, and the other half have missed their market, and are in want of specifications even for the next few weeks. These latter works have now to meet buyers and a fair amount of business has been done during the past week by them at approximately the prices quoted in our list of prices current. Since the advance in price reported last week has taken place, the rush of orders for wire nails, which had been considerable, has given way to a more steady demand as far as the English home trade is concerned, but the new price is fully maintained; for export the demand is more lively than ever and 8s. 6d. per keg f.o.b. Antwerp for Nos. 0-7 is readily paid by buyers. Many of the wire nail works are full of orders till May, and few only are sellers for March delivery.

**Derbyshire Miners' Association.**—At a meeting of the Derbyshire Miners' Association on Monday, Mr. W. E. Harvey was appointed corresponding and financial secretary. It was decided to appoint another official as assistant secretary, to live at Chesterfield.

## Wales.

### SWANSEA.

**Swansea.**—The relaxation of German competition in English tin plate markets has been succeeded by a determined effort on the part of Belgian manufacturers to extend their business in this country. Belgian competition is even more serious than German, for while Germany principally exported raw material, Belgium is sending finished steel sheets, girder plates, joists, and wire. Black sheets are delivered in Birmingham from Liege at 5s. to 10s. per ton below Staffordshire prices, and one Midland firm is taking 200 tons monthly. The shipments of tinplates has been rather less than the receipts from the works, showing a slight increase in the stock, and this may be attributed to

the tonnage being delayed through stormy weather. There is no improvement to report in the condition of the trade, and there has been a considerable divergence between the producer and consumer of plates as to prices the former seeking to obtain adequate figures to cover the actual cost (if not a possible loss). The falling off in the shipments to some extent may be said to be caused by the reduced shipments to Russia and its dependencies, the state of that country being such as to completely disorganise their trade, together with no doubt an over production, although there has been no increase in the number of mills at work, but the work is

(Continued on page 429.)



# Employment in the Engineering, Shipbuilding, Iron, Steel, and Tinplate Trades.

Compiled from the Board of Trade Returns for January.

## Engineering Trades.

Employment during January was generally good, showing an improvement on the previous month, and being much better than a year ago. Much overtime was worked, and the percentage of unemployed was the lowest recorded since October, 1900.

The districts showing the greatest improvement on the previous month were the Notts, Derby, and Leicester district, and the Hull and Lincolnshire district. Small increases in the percentage of unemployed were shown in the Belfast and Dublin district, and in the Glasgow district.

As compared with a year ago, an improvement was shown in every district except the South Coast and the South Wales and Bristol district, the most marked being in the Oldham, Bolton, and Blackburn district, the Notts, Derby, and Leicester district, Belfast and Dublin, and the East of Scotland.

Returns relating to 148,506 members of trade unions show that 3·2 per cent. were unemployed at the end of January, as compared with 3·7 per cent. in December, 1905, and 6·9 per cent. in January, 1905.

The percentages for the various districts are shown below:—

On the North-East Coast employment was generally good, a further improvement being shown in most branches as compared with previous months. A considerable amount of overtime and double shift work was reported on the Tyne and Wear. Employment was also generally good in the Darlington, Tees, and Hartlepool district.

There was little change in the Manchester district, employment generally being good, except with boiler-makers at Salford, who reported it as bad. At Liverpool employment was good with engineers and iron-founders, but dull with brass founders and copper-smiths. At Bootle and Birkenhead it was fair. At Blackburn employment was good, and over-

was moderate and rather worse than a month ago. At Bolton, Oldham, and Burnley it was good, and some overtime was worked in textile machinery shops. At Barrow-in-Furness employment remained about the same as in the previous month.

Employment at Leeds generally continued fairly good, though with boiler makers it was quiet. At Wakefield and at Stanningley it was fair.

Employment remained good on the whole at Sheffield and Rotherham, and moderate at Barnsley. At Bradford, Keighley, Huddersfield, and Dewsbury, some improvement was reported, and employment was generally good, some overtime being worked. In the Hull district there was a decrease in the percentage of unemployed, and employment, though dull with pattern-makers, was fair generally. At Doncaster full time was resumed at the railway shops.

In Derbyshire employment generally was quiet; it was bad with engineers at Derby, but improving with boilermakers. In Nottingham and district employment remained good in the hosiery and lace machine branches, and fairly good with cycle workers

District.	No. of Members of Unions at end of Jan., 1906, included in the returns.*	Percentage returned as Unemployed at end of			Increase (+) or Decrease (—) in percentage unemployed for Jan., 1906, as compared with a	
		Jan., 1906.	Dec., 1905.	Jan., 1905.	Month ago.	Year ago.
North-East Coast ... ..	14,855	3·0	4·0	5·4	— 1·0	— 2·4
Manchester and Liverpool District ... ..	17,858	3·1	3·3	8·1	— 0·2	— 5·0
Oldham, Bolton, and Blackburn District ... ..	11,707	3·5	3·5	11·8	...	— 8·3
West Riding Towns ... ..	12,168	3·7	4·5	9·2	— 0·8	— 5·5
Hull and Lincolnshire District ... ..	3,588	3·2	4·3	6·2	— 1·1	— 3·0
Birmingham, Wolverhampton, and Coventry District ... ..	6,724	2·0	2·3	4·7	— 0·3	— 2·7
Notts, Derby, and Leicester District ... ..	3,783	4·4	6·0	11·1	— 1·6	— 6·7
London and Neighbouring District ... ..	12,500	3·1	3·8	4·4	— 0·7	— 1·3
South Coast ... ..	3,821	2·8	3·6	2·2	— 0·8	+ 0·6
South Wales and Bristol District ... ..	6,587	3·1	4·1	2·9	— 1·0	— 0·2
Glasgow and District ... ..	14,358	4·2	4·0	8·5	+ 0·2	— 4·3
East of Scotland ... ..	3,655	7·0	7·0	12·1	— 1·0	— 6·1
Belfast and Dublin ... ..	3,402	6·9	6·5	13·2	+ 0·4	— 6·3
Other Districts ... ..	5,336	2·7	4·0	5·1	— 1·3	— 2·4
<b>United Kingdom</b> (Including certain Unions for which district figures are not available)	<b>148,506</b>	<b>3·2</b>	<b>3·7</b>	<b>6·9</b>	<b>— 0·5</b>	<b>— 3·7</b>

\* Some members worked at Preston in

and motor car builders. It was improving with tool makers and patternmakers, but still dull with general engineers, ironfounders, and boilermakers. At Grantham and Lincoln it was fairly good. At Leicester it was good, and showed an improvement with engineers at Northampton and ironfounders at Leicester. In the Birmingham and Wolverhampton districts employment generally was fairly good.

Employment in the Potteries district was improving.

In the Eastern Counties employment generally was fair, but was dull at Norwich.

In London some improvement was shown, employment being slightly better than in the previous month. Work was still slack in some East End branches.

In the dockyard towns employment remained dull. At Southampton it was fair, and some overtime was worked.

In South Wales employment generally was fair. At Bristol employment was still dull, though improving. It was good at Swindon and Gloucester.

Employment in the Clyde district remained fairly good. Patternmakers were well employed, and an improvement was shown with brass finishers at Glasgow; much overtime was worked. Employment remained bad in the Leith and Edinburgh district. At Aberdeen it was good, and some overtime was worked. At Dundee it continued fair.

At Belfast employment was fair generally. It was good with patternmakers and improving with engineers. At Dublin it was generally bad, though with brassfounders an improvement on the previous month was shown. At Cork employment remained dull.

## Shipbuilding Trades.

Employment improved considerably during January, and was much better than a year ago.

Branches of Trade Unions with 50,772 members had 4,483 (or 7.9 per cent.) unemployed at the end of January, as compared with 10.2 per cent. at the end of December, and 12.4 per cent. a year ago.

Compared with December, 1905, the most marked improvement, as indicated by the percentages of unemployed, was in the Belfast, Humber, and Mersey districts.

Compared with a year ago, considerable improvement is shown on the North-East Coast, the Humber and Belfast districts; but the Mersey and the districts in the South of England and Wales, which are chiefly

repairing centres, were not so well employed as a year ago.

Employment on the Tyne and Wear was, on the

District.	No. of Members of Unions at end of Jan., 1906, included in the returns.*	Percentage returned as Unemployed at end of			Increase (+) or Decrease (—) in percentage for Jan., 1906, as compared with a	
		Jan., 1906.	Dec., 1905.	Jan., 1905.	Month ago.	Year ago.
Tyne and Blyth ... ..	9,489	6.0	8.3	15.4	— 2.3	— 9.4
Wear ... ..	4,951	4.3	4.2	11.4	+ 0.1	— 7.1
Tees and Hartlepool ... ..	5,129	3.7	5.3	20.5	— 1.6	— 16.8
Humber ... ..	2,413	3.9	9.5	13.7	— 5.6	— 9.8
Thames and Medway ... ..	9,654	10.9	12.1	8.5	— 1.2	+ 2.4
South Coast ... ..	4,000	9.5	9.7	5.4	— 0.2	+ 4.1
Bristol Channel Ports ... ..	3,106	10.0	12.9	6.9	— 2.9	+ 3.1
Mersey ... ..	4,244	12.0	16.2	10.8	— 3.6	+ 1.8
Clyde ... ..	4,999	8.1	11.7	12.0	— 2.9	— 3.9
Dundee, Leith, and Aberdeen ... ..	2,546	14.1	13.6	17.7	+ 0.5	— 3.6
Belfast ... ..	3,230	3.0	15.1	14.4	— 12.1	— 11.4
Other Districts ... ..	3,108	8.4	8.7	8.8	— 0.3	— 0.4
<b>United Kingdom ... ..</b>	<b>56,909</b>	<b>7.9</b>	<b>10.2</b>	<b>12.4</b>	<b>— 2.3</b>	<b>— 4.5</b>

\* Exclusive of Superannuated Members.

† Revised figures.

whole, good, and better than a month ago, except with smiths and strikers. It was good also with nearly all branches in the Tees and Hartlepool district. On the Humber it improved and was good with some overtime. In all these districts, from the Tyne to the Humber, employment was much better than a year ago.

In the Thames and Medway district employment, though slightly improved on the previous month, chiefly in the repairing branch, was slack, and worse than a year ago. At Southampton it was reported as fair and improved, but in other South Coast ports there was little change. At the Bristol Channel ports employment was better than a month ago, especially at Bristol, but not so good as a year ago. Ship joiners and painters on the Mersey reported employment as dull; other branches continued to improve.

On the Clyde it was fair generally, and showed an improvement in some branches. It was bad at Leith, improving at Dundee, and fairly good at Aberdeen with some overtime.

Employment improved considerably at Belfast, and was fairly good and much better than a year ago.

At Barrow it was moderate. In the Eastern Counties yards it improved.

## Iron and Steel Trades.

Employment at iron and steel works in January remained about the same as a month ago, most districts reporting it as good; it was considerably better than a year ago, 9.5 per cent. more workers being



	Number of Workpeople employed by firms making returns.			Average Number of Shifts worked per man.		
	In week ended Jan. 27th, 1906.	Increase (+) or decrease (-) as compared with		In week ended Jan. 27th, 1906.	Increase (+) or decrease (-) as compared with	
		A month ago.	A year ago.		A month ago.	A year ago.
<b>Departments.</b>						
Open-Hearth Melting Furnaces	8,433	- 69	+ 728	5'92	...	+ 0'11
Crucible Furnaces ...	587	- 8	+ 54	5'43	- 0'01	+ 0'05
Bessemer Converters ...	1,747	- 8	+ 55	5'18	+ 0'05	+ 0'34
Puddling Forges ...	10,001	+ 168	+ 393	5'26	- 0'01	+ 0'36
Rolling Mills ...	30,214	...	+ 2,168	5'36	- 0'02	+ 0'23
Forging and Pressing ...	3,970	+ 15	+ 731	5'12	- 0'03	+ 0'11
Founding ...	11,523	- 131	+ 1,288	5'91	+ 0'04	+ 0'06
Other Departments ...	9,619	+ 8	+ 1,367	5'87	- 0'04	+ 0'10
Mechanics, Labourers	16,863	+ 210	+ 1,218	5'86	- 0'01	+ 0'14
Total ...	92,957	+ 185	+ 8,032	5'62	- 0'01	+ 0'19
<b>Districts.</b>						
Northumberland & Durham	11,383	+ 48	+ 809	5'64	+ 0'10	+ 0'19
Cleveland ...	8,623	+ 272	+ 872	5'73	...	+ 0'07
Sheffield and Rotherham ...	17,756	- 5	+ 2,087	5'70	+ 0'01	+ 0'08
Leeds, Hull and other Yorkshire Towns	4,311	+ 11	+ 637	5'68	+ 0'03	+ 0'42
Cumberland, Lancs. & Ches.	9,863	- 11	+ 294	5'52	+ 0'11	+ 0'77
Staffordshire ...	10,127	+ 208	+ 705	5'53	- 0'04	+ 0'13
Other Midland Counties ...	4,472	+ 20	+ 280	5'46	- 0'19	+ 0'08
Wales and Monmouth	9,222	+ 139	+ 985	5'63	- 0'18	- 0'04
England and Wales	75,757	+ 682	+ 6,669	5'62	- 0'01	+ 0'20
Scotland ...	17,200	- 497	+ 1,363	5'62	...	+ 0'13
Total ...	92,957	+ 185	+ 8,032	5'62	- 0'01	+ 0'19

and each district showed an increase in the number of workpeople employed.

The average number of shifts worked per man per week varied little compared with a month ago. No department showed a difference of more than 0'05 of a shift, while the most appreciable changes in the districts were decreases of 0'17 of a shift in the Midland Counties other than Staffordshire, and of 0'18 of a shift in Wales and Monmouth.

Compared with a year ago, every department showed an improvement in the average number of shifts worked, the greatest increases being 0'77 of a shift in puddling forges and 0'42 of a shift in Bessemer converting departments. Each district also showed an increase, with the exception of Wales and Monmouth, where a slight decline occurred. By far the greatest increases were 0'77 of a shift in Cumberland, Lancashire and Cheshire, and 0'42 of a shift in Leeds, Hull, and other Yorkshire towns.

## Pig Iron Industry.

Employment in this industry continued good and was better than a year ago. The number of furnaces now in blast is greater than a month since November 1905.

Returns have been received relating to the works of 108 ironmasters. The number of furnaces in blast at the end of January, was 338, as compared with 336 at the end of December, 1905; three have been blown out and five re-lit; three of the latter were in Scotland

employed at the works covered by the returns received.

The total volume of employment (*i.e.*, numbers employed multiplied by the average number of shifts worked) during the week ended January 27th, 1906, at the 197 iron and steel works from which returns were received, was 0'11 per cent. greater than during the week ended December 16th, 1905, and 13'3 per cent. greater than a year ago.

The aggregate number of shifts worked during the week by all the workpeople included in the returns was approximately 522,000, as compared with 522,200 a month ago, and 491,400 a year ago.

Compared with a month ago, there was an increase of 1'68 in the number of workpeople employed at puddling forges, and of 1'20 in the number of mechanics and labourers, while the number employed in founding decreased by 1'31.

The greatest increases occurred in Cleveland (272), Staffordshire (281), and Wales and Monmouth (139). Scotland showed a decrease of 497, but there were no other appreciable changes.

Compared with a year ago, each department

Districts.	Number of Furnaces, included in the returns, in Blast at end of			Increase (+) or Decrease (-) in Jan., 1906, as compared with	
	Jan., 1906.	Dec., 1905.	Jan., 1905.	A month ago.	A year ago.
<b>ENGLAND &amp; WALES—</b>					
Cleveland ...	86	86	77	- 1	+ 8
Cumberland & Lancs.	38	38	37	...	+ 1
S. and S.W. Yorks.	16	16	12	...	+ 4
Derby & Nottingham	38	38	36	...	+ 2
Leicester, Lincoln, and Northampton	28	28	25	...	...
Stafford & Worcester	34	35	30	- 1	+ 4
S. Wales & Monmouth	14	14	11	...	...
Other districts ...	8	7	7	+ 1	+ 1
<b>Returned from England &amp; Wales</b>	<b>261</b>	<b>262</b>	<b>238</b>	<b>- 1</b>	<b>+ 23</b>
<b>Returned from Scotland</b> ...	<b>77</b>	<b>74</b>	<b>70</b>	<b>+ 3</b>	<b>+ 7</b>
<b>Total furnaces included in returns</b>	<b>338</b>	<b>336</b>	<b>306</b>	<b>+ 2</b>	<b>+ 32</b>

one in Staffordshire, and one in Shropshire. Compared with January, 1905, there was an increase of 32 furnaces, 25 in England and Wales, and seven in Scotland. The number of workpeople employed at the works included in the Returns, which are summarised below, is estimated at 24,000.

The imports of iron ore in January amounted to 760,214 tons, or 144,794 tons more than in January, 1905, and 276,222 tons more than in January, 1904.

The exports of pig iron from the United Kingdom during January, 1906, amounted to 90,700 tons, as compared with 43,844 tons in January, 1905, and 59,076 tons in January, 1904.

## Tinplate Works.

Employment during January continued very good, and was much better than a year ago.

At the end of January 419 mills were working, as compared with 417 at the end of the previous month. As compared with a year ago, there was an increase of 16 (4.0 per cent.) in the number of mills at work. The number of workpeople employed at the 419 mills was about 21,000.

The following table shows the number of mills at the works which were giving employment, full or partial,\* at each of the three periods :—

	No. of Works open.	No. of Mills in such Works.		
		Working.	Not Working.	Total.
Works giving full employment ...	66	366	—	366
Works giving partial employment ...	12	53	27	80
<b>Total at end of January, 1906*</b> ...	<b>78</b>	<b>419</b>	<b>27</b>	<b>446</b>
<i>Corresponding Total for Dec., 1905*</i>	78	417	26	443
<i>Corresponding Total for Jan., 1905*</i>	77	403	21	424

\* It will be understood that, in addition to the works returned as giving full or partial employment, a certain number of tinplate works were wholly idle at each of the dates to which the returns relate.

The Exports of Tinplates and Tinned Sheets and blackplates for tinning, are given in the table below for the three periods stated. It will be seen that of the total exports of tinplates, 3,192 tons, or nearly 11 per cent., went to the United States. The British East Indies

	Month ended Jan. 31st, 1906.	Increase (+) or Decrease (—) as compared with January.	
		1905.	1904.
<i>Tinned Plates and Tinned Sheets.</i>			
To United States ... ..	Tons. 3,192	Tons. — 3,251	Tons. — 2,468
„ Other Countries ... ..	25,871	+ 2,391	+ 3,558
Total ... ..	29,063	— 860	+ 1,090

took 4,494 tons, the Netherlands 3,557 tons, and Germany 1,812 tons. Of the blackplates exported 1,084 tons went to Russia and 495 tons to Germany.

## Obituary Notices.

WILLIAM SNAITH, locomotive and stores superintendent of the Central Division North-Eastern Railway, whose death is announced, acted as locomotive accountant of the Stockton and Darlington Railway until its absorption by the North-Eastern Railway. He recently completed sixty years' railway service, during fifty-two of which he had occupied an executive position.

HENRY JAMES CHANLY, superintendent of the Standards Department of the Board of Trade, died last week. Born in 1842, he was educated privately at Windsor, and entered the Civil Service in 1859 being appointed the following year to the Exchequer to take charge of the technical duties arising under the Sale of Gas Act, 1859. For a lengthened period he was secretary to the Royal Commission on Standards, and in that capacity, showing much aptitude for the technicalities of the position, was, on the retirement in 1876 of the Warden of the Standards, appointed his successor as superintendent of the Standards Department of the Board of Trade, a position which he had since occupied.

JOHN MACKAY, Hereford.—Last week the death occurred of John Mackay, engineer and contractor, at Hereford, deceased having attained his eighty-fourth year. Among the enterprises in which he took an active interest may be mentioned the Cardiff and Ogmore Railway, the Dowlais tunnel on the London and North-Western Railway, the Morriston Railway Swansea, the Pontypridd tunnel on the Barry Railway, and portions of the Cardiff Corporation Water Works. Mr. Mackay had numerous interests outside his profession, including more particularly the promotion of Genealogical



# The Protection of Workers in Mines and Factories.

THE invention of suitable apparatus for the protection of workers in mines from "gassing" has been a fruitful theme for discussion from time to time among the technical societies, and much ingenuity has been expended upon the problem by inventors, but judging from reports which reach us from various quarters there is still a considerable demand for improved appliances. This demand is

likely to increase also in businesses where operations are carried on which endanger the life of the worker and in connection with the extended use of producer gas. The latest safety appliances to come under our notice have been perfected by Messrs. Wallach Bros., of 57, Gracechurch Street, E.C. They bear the generic name "Evertrusty" and include a variety of face masks, eye protectors, etc.

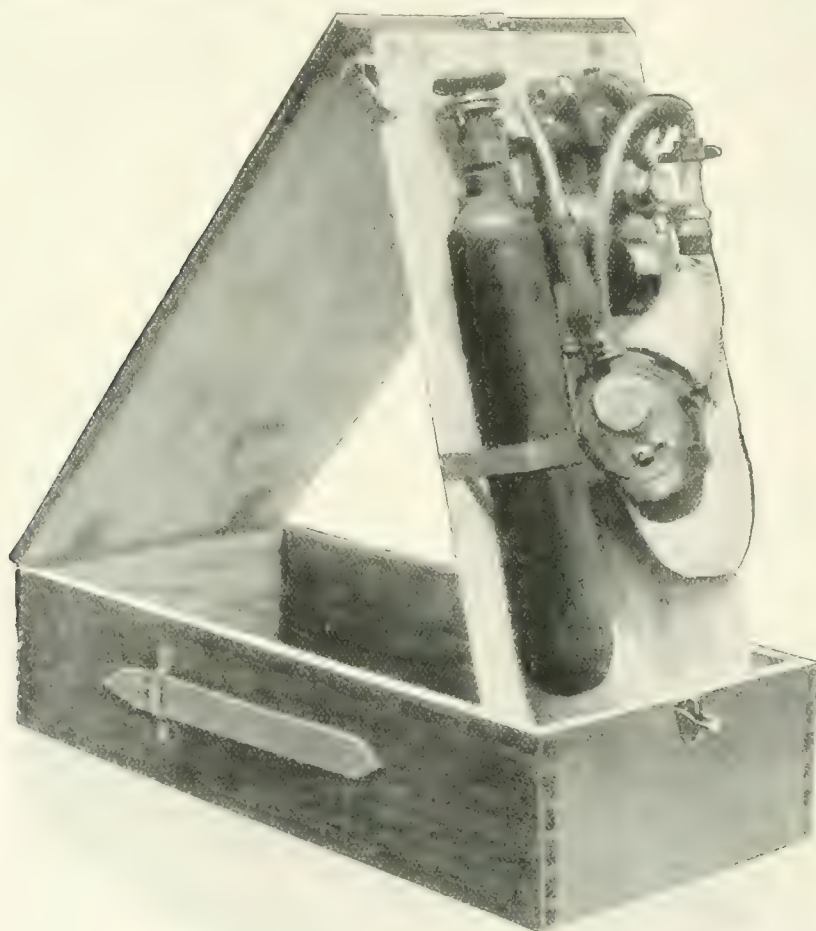


FIG. 1. THE "E" OXYGEN APPARATUS IN CASE.

Figs. 1 and 2 show a set of life-saving apparatus designed by the firm for use in coal mines, chemical works, oil and gas tanks, etc. It is carried by means of shoulder straps on a light frame, and is equipped with two oxygen cylinders, either of which may be used by turning the hand wheels.

The reducing valve has a stop valve attached to it, enabling the apparatus to be tested without loss of oxygen, immediately before use. The reducing valve also comprises a safety valve. The improved nozzle has a bore of only about  $\frac{1}{16}$  in., and practically takes the place of a stop valve. It is provided with a dart and a dust collecting chamber. The pressure gauge serves to measure the length of time the apparatus has been in use.

The regulator is constructed so as to admit of instant inspection of the various parts at any time, but, when closed is, of course, perfectly airtight. It serves a most

important purpose, viz., to ascertain that the apparatus prior to use is in perfect working order, and to obviate the possibility of connecting a regenerator to an empty cylinder.

The helmet (fig. 3) is constructed on entirely new lines. As the dead space in front of the mouth should, in oral respiration be as small as possible, this apparatus has two bags quite independent of each other, and separated from the body by valves, which consist of very thin mica discs (without springs) fixed so as to prevent all possibility of sticking fast, through moisture or otherwise.

### Helmet.

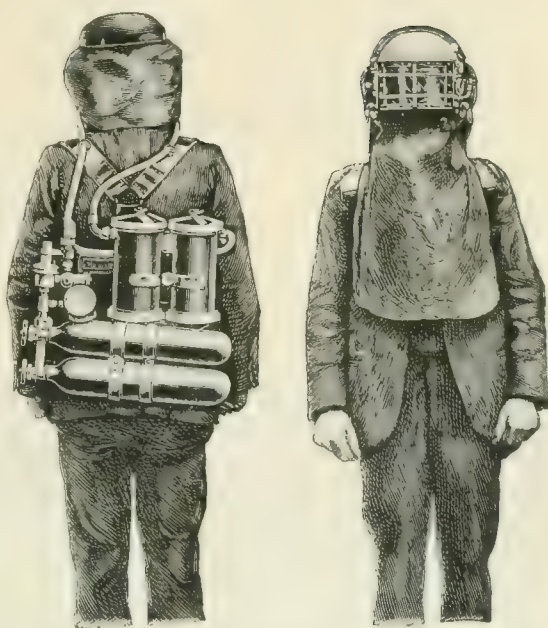
The helmet is provided with a glass front rendered air-tight by means of rubber tubing which can be inflated by the wearer if necessary, and can be easily opened, when outside the danger zone, to admit fresh air to the operator. It is held in position by a screw. The supply of oxygen is so regulated that one part flows direct into the helmet, whilst the other enters the bag and is there temporarily stored.

A branch supply pipe runs parallel with the glass front, and has a large number of perforations through which expired air escapes. This prevents the glass from becoming dim. Expired air is thus immediately removed, and exhalation is not impeded by pressure inside the helmet. To ensure obtaining these conditions the expiration bag which absorbs the oxygen is provided with an adjustable automatic safety valve, any pressure on which is sufficient to completely empty it. By taking off the screw cap inside, this safety valve can be made to answer the same purpose as regards the helmet.

Fig. 4 shows a tank oxygen instead case, which has been designed for use in cases of carbonic oxide poisoning through water gas, power gas, etc., or for similar the inhalation of poisonous gases in mines. The weight of the apparatus is about 11 lb.

### Aluminium Respirator.

On page 42 is shown the aluminium respirator which received the recommendation of the Society of Arts in the inquiry reported a few months ago in PAGE'S WEEKLY. It has, we understand, also met with the approval of H.M. inspectors of factories. The respirator has an automatic outlet valve for the escape of expired air, while that which is inhaled is filtered through an absorbent material such as cotton wool, which can be easily renewed.



FIGS. 1 AND 2. BACK AND FRONT VIEWS OF THE APPARATUS.

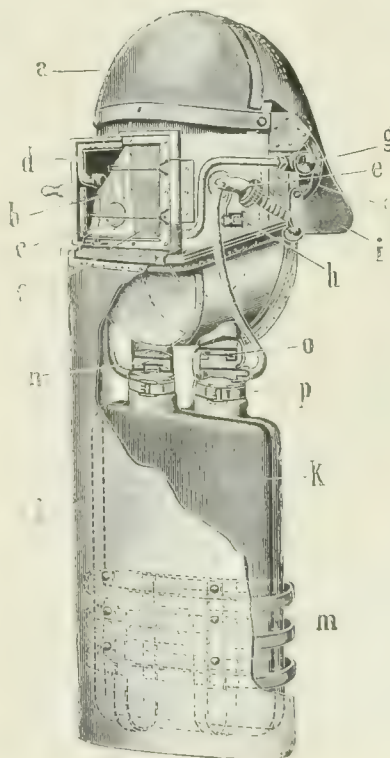


FIG. 3. SECTION OF HELMET.



## Our Weekly Biography.

**Sir William H. Bailey, J.P., Director of the Manchester Ship Canal.**

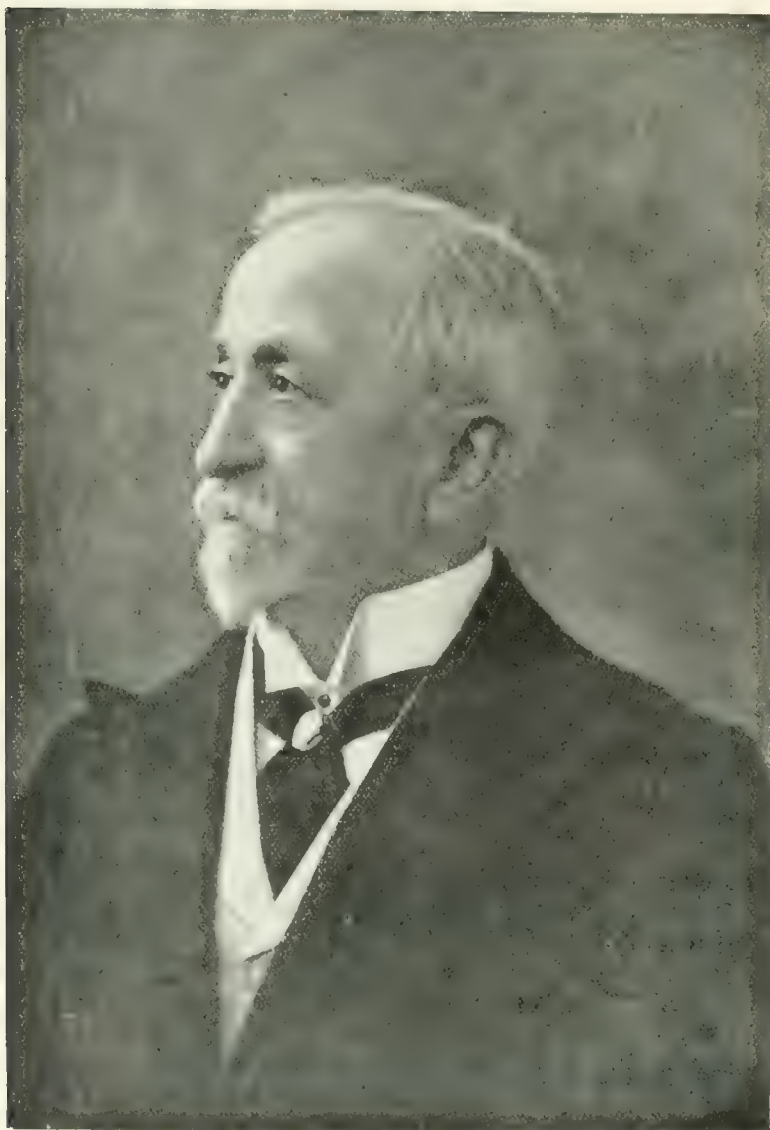
**I**N the north of England, where his interests are mainly concentrated, the name of Sir William H. Bailey stands for culture, enterprise, and progress. A graceful recog-

nition of his high reputation was recorded in this journal some time ago when he received a unanimous invitation to officiate at the unveiling of the Joule memorial in Sale Park.

The committee's choice could not have fallen on one more fitted to perform the ceremony, for Sir William is President of the Manchester Literary and Philosophical Society, with which the late distinguished physicist was intimately associated.

Born at Salford in 1838, the subject of this sketch is the son of the late Mr. John Bailey, of Pendleton, who, for a quarter of a century, was a member of the Salford Town Council. The father of Sir William was at one time in charge of the experimental department of Messrs. Sharpe and Roberts, Atlas Works, where he watched the development of several of the inventions of Richard Roberts. Mr. John Bailey subsequently founded the business which at a later date was controlled by his son of whom it may be said that he follows an hereditary vocation.

Educated at the Manchester Grammar School, at the age of fifteen Sir William



SIR WILLIAM H. BAILEY, J.P.

began his strenuous career, working at the lathe and vice in his father's factory. His early experience was not entirely concerned with mechanics, for when the establishment was closed in the evening the young engineer used to turn his hand to practical book-keeping, and thereby secured a direct acquaintance with such questions as cost and maintenance. Before he attained his majority Sir William's inventive genius was responsible for several profitable patents, and since that date the records of the Patent Office bear ample evidence of the fertility of his ideas.

In 1874, Sir William was elected member of the Salford Town Council; six years later he was advanced to the dignity of alderman; while in 1894 he became chief magistrate. It was during his mayoralty that Queen Victoria opened the Manchester Ship Canal. Sir William was one of the prime movers in this undertaking,

and his ripe experience contributed largely to the success of the enterprise. It was on this account that, in 1894, he received the well-merited distinction from Her Majesty, who conferred upon him the honour of knighthood.

In addition to having a controlling interest in the Albion Works, Sir William Bailey is a director of a number of other important companies, including the Ebbw Vale Steel and Iron Company and the Manchester Ship Canal. From 1885 to 1887 he occupied the chair of the Manchester Association of Engineers. He is a member of the Iron and Steel Institute, and the Mechanical Engineers' Society. In addition to being President of the Manchester Literary and Philosophical Society, Sir William presides over various other literary and artistic associations, and is a skilled writer on a diversified field of subjects.

## Shipbuilding Items.

### Institution of Naval Architects.

The annual meeting of the institution will take place on Wednesday, April 4th, and the two following days, in the Hall of the Society of Arts, John Street, Adelphi, W.C., by kind permission of the Council. The Right Hon. the Earl of Glasgow, G.C.M.G., LL.D., president, will occupy the chair. The annual dinner will be given on Wednesday, April 4th, in the Grand Hall, Hotel Cecil, Strand, W.C., at 7.30 p.m. The following resolution has been passed by the Council:—  
Resolved—"That the Council will be willing to present a gold medal to any person, not being a member or associate member of Council, who shall at the forthcoming meetings read a paper which, in the judgment of the Council, shall be deemed to be of exceptional merit. The Council will also be willing to present a premium of books or instruments to the reader of any paper, not being a member or associate member of Council, which paper shall, in the judgment of the Council, merit this distinction."

In the accompanying illustration is shown a 55 ft. boat recently completed by Messrs. John I. Thornycroft and Co., Ltd., to the order of the Governor of Nova Goa (Portuguese India). The boat, it will be seen, has cabins fore and aft, while the engine, a 6-cylinder 6 in. by 8 in., developing 78 b.h.p., is placed amidships. The engine is adapted to use paraffin as fuel. During a recent test the boat developed the satisfactory speed of 12 miles per hour, and is now on her way to Marmagoa. The principal dimensions are: Length, 55 ft.; beam, 8 ft.; draft, 3 ft. 6 in.



BOAT ADAPTED FOR PARAFFIN FUEL.



## Correspondence.

### The Proposed Bessemer Commemoration.

Salisbury House, London, E.C.,

February 14th 1906.

To the Editor of PAGE'S WEEKLY.

SIR,—On June 20th 1905 a meeting was held at the Mansion House under the presidency of the Lord Mayor (Sir Marcus Samuel, Bart.) to inaugurate a memorial to the late Sir Henry Bessemer.

At that meeting the following resolution was moved by the Duke of Norfolk, seconded by Professor H. M. Howe, of Columbia University, New York, and unanimously adopted—

"That this representative meeting heartily endorses the proposal to commemorate the great achievements of the late Sir Henry Bessemer, the inventor of the metallurgical process which bears his name; and strongly urges that such commemoration should have for its object some educational work as far reaching in its beneficent influence as are the results of Bessemer's great invention."

In April, 1904, the President of the Board of Education appointed a departmental committee to inquire into the working of the Royal College of Science and Royal School of Mines, in connection with other existing or projected institutions, for teaching of the iron metal. It was therefore necessary for the memorial committee to defer the active prosecution of their scheme pending the decision of the Government Committee in regard to the position and future organization of the Royal School of Mines with which the memorial is to be united.

The departmental committee having presented their final report, the memorial committee are now in a position to take the necessary steps to carry out their proposals.

We are confident that no memorial could be more appropriate than one which has for its object the continuing development of the great metallurgical achievement upon which the prosperity of the British Empire largely depends, and we are assured that none would be more likely to have met with Bessemer's own approval or more likely to inspire students to emulate his example of untiring effort for the advancement of industrial methods and processes.

It is not necessary to dwell on the magnitude of the benefits that have accrued to mankind as the direct result of Bessemer's achievements.

We, therefore, appeal with confidence to the industrial and general public for their generous support to the memorial fund, the objects of which are—

(A) The establishment of open international memorial scholarships for post-graduate practical work tenable (except such as it is intended to allocate to the Royal School of Mines, the Sheffield and Birmingham Universities, the Armstrong College, Newcastle-upon-Tyne, or other approved British institutions) in any part of the British Empire, in the United States of America and in Europe. It is intended that these scholarships shall be of such value and shall be awarded under such conditions, that they will be regarded by students of any nation as a prize worth striving for, and as an incentive to the highest scientific attainment.

(B) The equipment of mining and metallurgical memorial laboratories in the Royal School of Mines at South Kensington as the centre of the memorial.

NOTE.—The land and the cost of the new buildings and maintenance for the school will be provided from Government and other sources.

(C) The erection of a statue of Bessemer in the new Royal School of Mines at South Kensington.

It is hoped that the movement may commend itself to the citizens of all nations who have benefited materially by Bessemer's work.

Communications should be addressed to the hon. secretary, Bessemer Memorial Fund, Salisbury House E.C., and all cheques should be made payable to the "Bessemer Memorial Fund" and crossed "Bank of England."

Formal receipts will be issued in reply to all contributions received, and a list of these will be published in due course.

We are, Sir, on behalf of

Memorial Committee

Your obedient servants,

Wm. H. Preece, chairman; J. Wolfe Barry, vice-chairman; Julius Wernher, Francis Mowatt, trustees; R. A. Hadfield, President of the Iron and Steel Institute; Wm. Frechville (President of the Institution of Mining and Metallurgy); Alverstone, Strathcona, R. B. Haldane, Marcus Samuel, David Dale, Edward P. Martin, James Douglas (New York), Henry M. Howe (Columbia University, New York), C. Eliot (vice-chancellor of the University of Sheffield), Oliver Lodge (principal of the University of Birmingham), Isambard Owen (principal of Armstrong College, Newcastle-on-Tyne), Charles Allen, Christopher Furness, C. Algernon Moreing, Thomas Wrightson, Hennen Jennings.

C. McDERMID, Hon. Secretary.

P.S.—Subscriptions (amounting to about £8,000) towards the very considerable sum that will be required have been already received or promised.

## 8 $\frac{1}{2}$ -in. High-Speed Capstan Lathe.

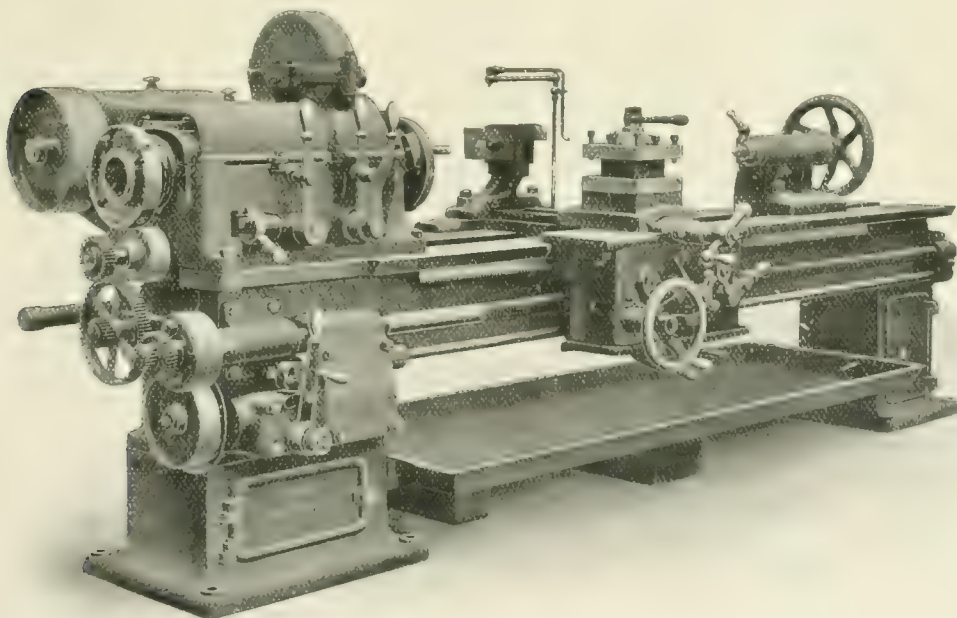
By the Tangye Tool and Electric Company, Ltd., Birmingham.

THE high-speed capstan lathe illustrated below has an approximate weight of 2 $\frac{1}{2}$  tons. The bed is 10 ft. long to admit 5 ft. 6 in. between centres; the fast headstock is of the firm's gear type with single driving pulley 14 in. diameter for 4 in. belt, which gives a large belt power, and avoids any belt shifting such as is required on cone pulley lathes. This pulley is carried on a separate shaft which runs in gun-metal bearings, lubricated by means of oil rings.

The headstock has 16 speeds ranging from 400 revolutions per minute down to 8 revolutions per minute, and changes are made by means of levers in the front of the lathe. The maximum purchase of gearing is 39 to 1, thus admitting of heavy cuts being taken on the largest diameter of work that can be swung in the lathe. It will be seen that the

whole of the headstock gearing is completely enclosed, an essential feature when using high-speed steel at quick speeds.

The loose headstock has spindle 2 $\frac{1}{2}$  in. diameter with cross adjustment by screw. The saddle has self-acting sliding and surfacing motion driven from a shaft in front, and is fitted with separate stop motion and drop out worm. There are six changes of feed to the gear box by means of two levers giving 8, 12, 18, 32, 48, and 72 revolutions per inch of traverse. The capstan rest is of forged steel arranged to take four tools. The screw cutting is worked from a separate guide screw with reversing motion inside the fast headstock. The lathe is specially arranged for quick handling and large output, and has very complete arrangements of suds stays and pump for supplying suds and oil to the tool.



8 $\frac{1}{2}$ -IN. HIGH-SPEED CAPSTAN LATHE.



# Large Locomotive Boilers.

By G. J. Churchward, Chief Mechanical Engineer, Great Western Railway.

THE modern locomotive question is principally a question of boiler. The great increase in the size of boilers and in the pressure carried, which has taken place during the past few years, has necessitated the reconsideration of the principles of design which had been worked out and settled during many years' experience with comparatively small boilers carrying low pressures. The higher temperatures incidental to the higher pressures have required the provision of much more liberal water-spaces and better provision for circulation. Locomotive engineers have now apparently settled down to the use of one of two types of boiler for very large engines, the wide firebox extending over the frames and wheels, and the long narrow box sloping up over the axles behind the main drivers.

## Effect of Contracted Loading Gauge.

In Great Britain the contracted loading gauge prohibits the use of the wide fire-box type over wheels larger than 4 ft. 6 in. diameter, so that it is not being used so generally as in America, where it is becoming practically universal. In America the great power of engines now employed renders the wide fire-box a necessity, but in great Britain, where the coal burnt per mile is very much less, few boilers of this kind have been built. On the Great Northern Railway Mr. Ivatt has provided his fine "Atlantic" class with wide fire-boxes, shown by fig. 8, and they are undoubtedly very successful. On the North Eastern Railway Mr. Worsdell has also designed a wide box for the boiler of his new "Atlantic" type. Mr. Holden's boiler on the heavy suburban engine for the Great Eastern Railway is the largest of the type yet built

in this country (see fig. 3). For the Great Western Railway Mr. Dean designed and built some goods engines with wide fire-boxes, shown by fig. 11, and the author has since designed but not yet built, a modified form of the same type to be carried over 4 ft. 6 in. wheels (fig. 10).

Much more experience has been gained with the wide box in America than in this country, and, so far as the author has been able to ascertain, it has been found there that the poorer coals in large quantities can be burnt with much greater facility and economy in this type than in the narrow pattern. This advantage is offset to some extent by the fact that, when standing there is considerable waste in the wide grates as compared with the narrow, and this is, of course, serious when goods trains are kept standing about, as is often the case here. This disadvantage has been found on the Great Western Railway, but no doubt careful design and fitting of ashpan will keep this waste within bounds.

## Causes of Tube Trouble.

A much more serious trouble has been found in the leaking of tubes in these boilers. This seems to be quite general, and the Master Mechanics' Association has a committee specially going into this question with a view to finding a remedy. All methods of tube expanding have been tried, and also much wider spacing, even up to and over one inch, without curing the trouble. The reduction of the depth of the fire-box in order to get a long box sloping over the trailing wheels of coupled engines, certainly increased the trouble from leakage of stays, but the alternative of a wide fire-box entails a much heavier engine

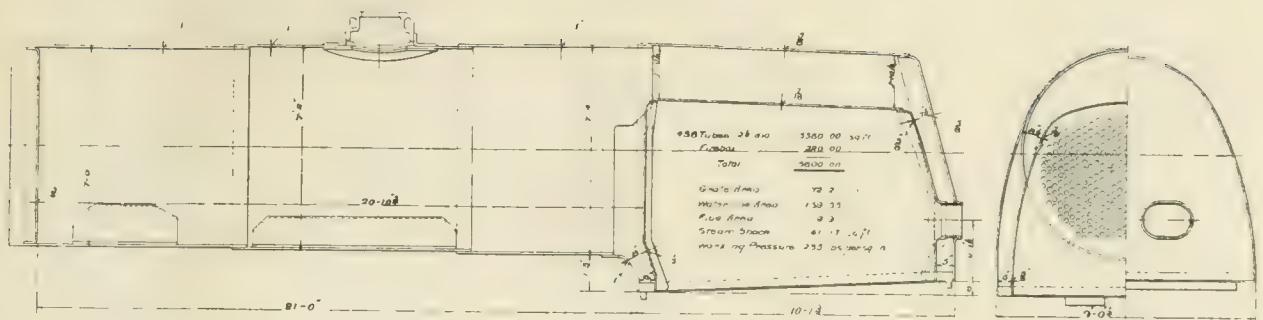


FIG. 1. MALLET COMPOUND.—BALTIMORE AND OHIO.

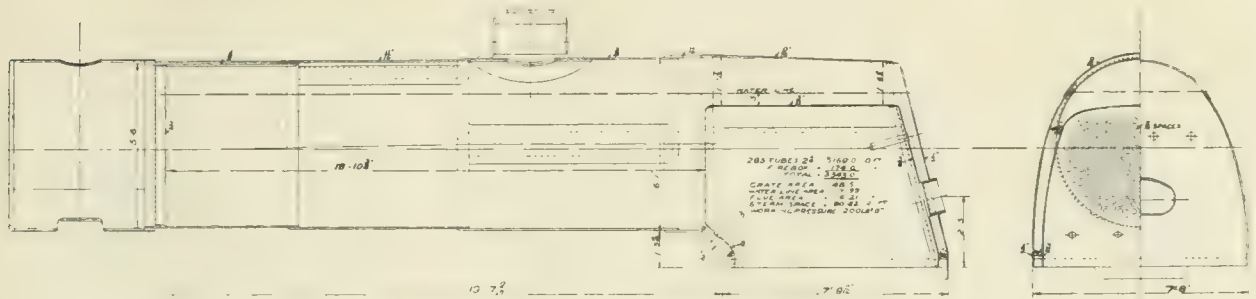


FIG. 2. LAKE SHORE AND MICHIGAN SOUTHERN.

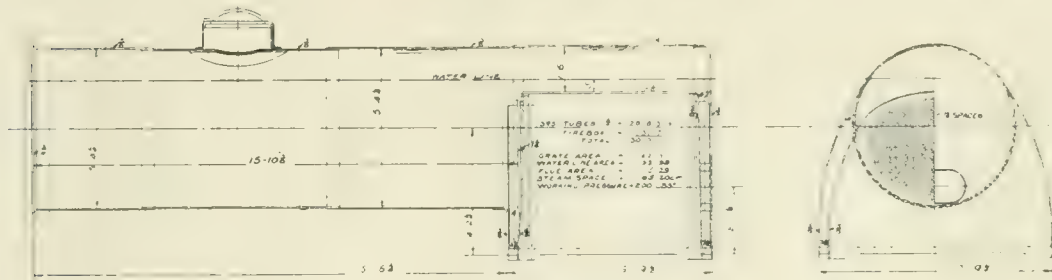


FIG. 3. DECAPOD.—GREAT EASTERN.

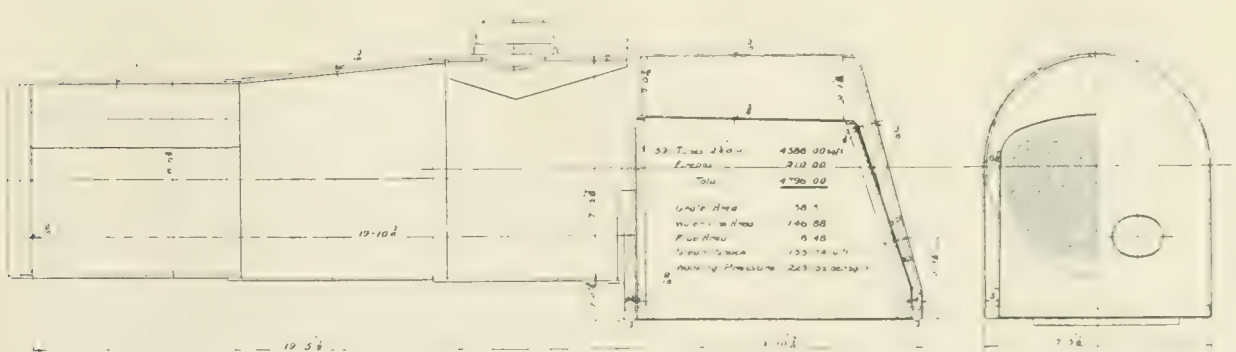


FIG. 4. 2-10-2 TANDEM COMPOUND, ATCHISON-TOPPERA AND SANTA FE.









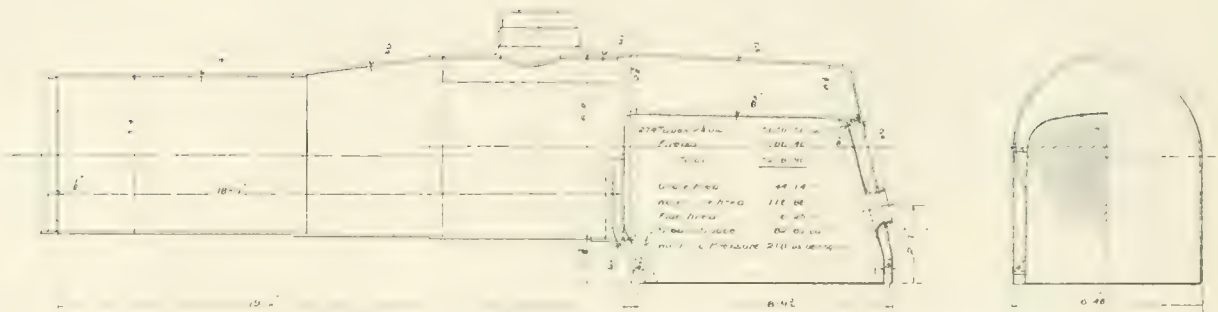


FIG. 9. BALDWIN 4-CYLINDER COMPOUND.—CHICAGO, BURLINGTON AND QUINCY.

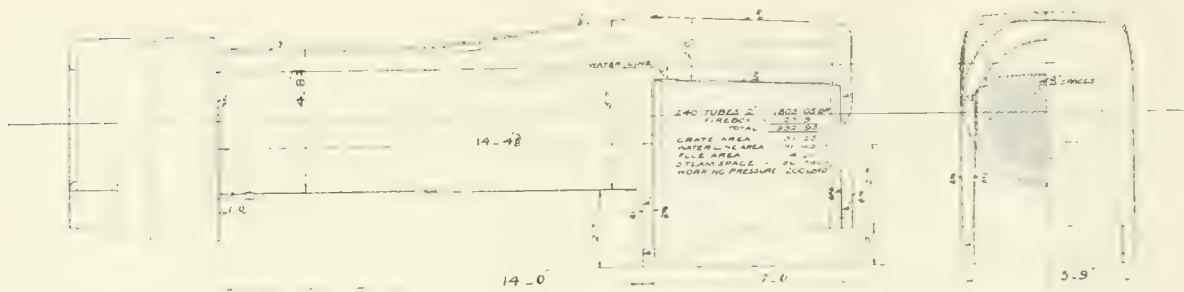


FIG. 10. GREAT WESTERN.

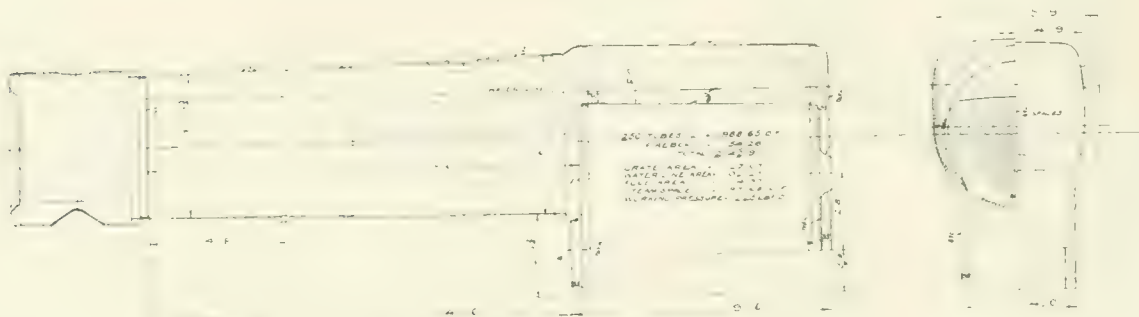


FIG. 14. NO. 1. GREAT WESTERN.

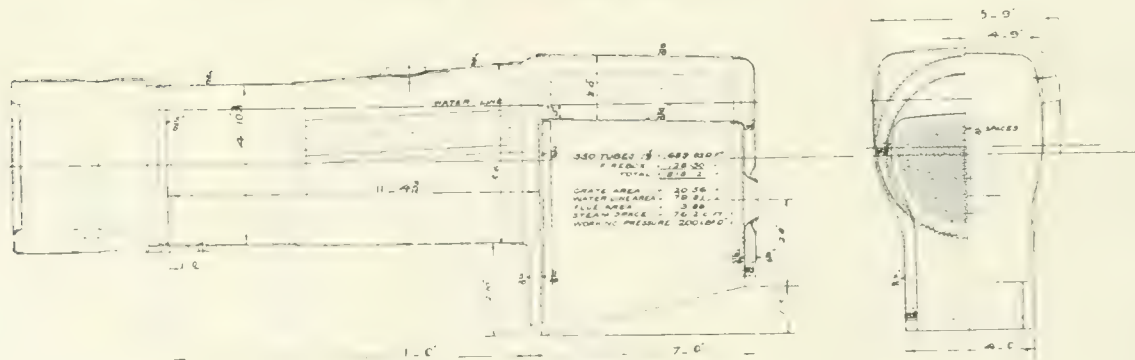


FIG. 20. NO. 4. GREAT WESTERN.

in some designs of wide fire-box boilers is due to the use of 6-coupled wheels in front of the fire-box. Experience of long tubes appears to be quite satisfactory, and they certainly keep up the economical efficiency of the boiler when it is being forced to the limit of its capacity. In this respect the long tube fulfils the same function as the Serve tube (which is favoured so much on the Continent) performs in boilers with shorter barrels.

#### Factors Affecting Steaming Qualities.

The ratio of diameter to length of the tube undoubtedly has a most important bearing upon the steaming qualities of the boiler and upon the efficiency of the heat absorption. This is more particularly noticeable when the boilers are being worked to the limit of

their capacity. If 2-in. tubes, say, are employed in barrels 11 to 12 ft. long, when the boiler is being forced the length is not sufficient to absorb the heat from the amount of gases that a 2-in. tube will pass, and overheating and waste result. The amount of tube-leaking which is experienced with modern wide boxes in America, has brought up again the idea that the spacing should be wider, say, 1 in. instead of  $\frac{3}{4}$  in., but from the investigations of a Master Mechanics' Committee, it appears that the wider spacing does not cure the trouble. It is clearly of no use to provide wider spaces for the upward current, unless equivalent area is provided for the downcoming water.

*(To be continued.)*

Paper read before the Institute of Mechanical Engineers.

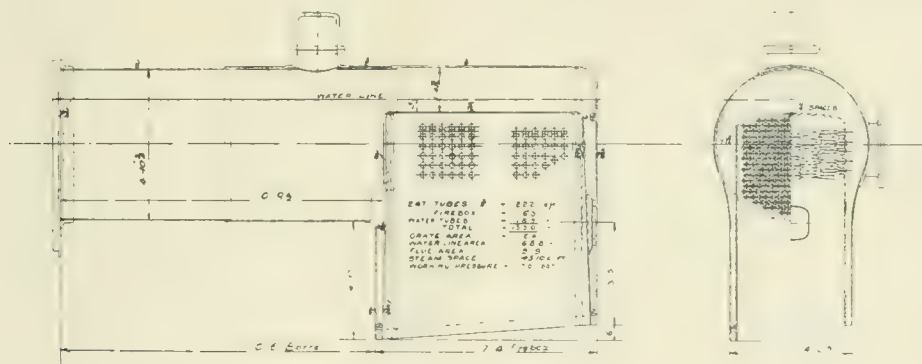


FIG. 27. WATER TUBE. LONDON AND SOUTH WESTERN.

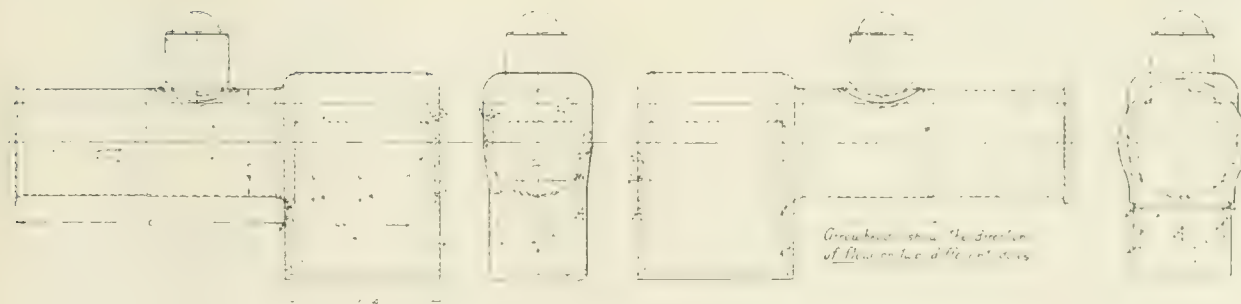


FIG. 28. CIRCULATION OF WATER WITH TWO DIFFERENT METHODS OF FIRING.



# Changes in Rates of Wages and Hours of Labour.

## Wages.

The net effect of all the changes in wages reported in January (latest Board of Trade reports) was an increase of £3,566 per week, as compared with an increase of £954 per week in December, 1905, and a decrease of £1,030 per week in January, 1905. The number of workpeople affected was 117,702, of whom 115,033 received advances amounting to £348, per week, and 2,049 sustained decreases amounting to £116 per week. The total number affected in December was 26,356, and in January, 1905, 63,823.

Four changes, affecting 87,041 workpeople, were arranged by Conciliation Boards or mediation, thirteen changes affecting 12,000 workpeople took effect under sliding scales, and the remaining changes, affecting 19,661 workpeople, were arranged directly between

employer and workpeople, or their representatives. In four cases, affecting 89 workpeople, the changes were pre-empted by dispute, arising out of work.

## Hours.

No changes in hours of labour were reported during January, 1906.

## Principal Changes in Wages in January.

Particulars of the principal changes in rates of wages reported in January are given below. The details of the other changes reported in January are not separately stated in this table, but they are included in the preceding statistics.

Trade.	Locality	Date from which change takes effect in 1906	Occupation	Approximate Number of Workpeople affected by		Particulars of Change (Decreases in Italics)
				Increase	Decrease	
Mining	Northumberland	8 & 15 Jan.	Coal Miners — Underground Workers and Banksmen except Deputies, Mechanics, Enginemen, and Firemen; Other Surface Workers	35,000	...	Advance of 1½ per cent. on standard rates, making wages 16½ per cent. above the standard of November, 1879.
		5 & 12 Feb.	Deputies... ..	1,100	...	Advance of 1 per cent. on standard rates, making wages 13 per cent. above the standard of November, 1879.
			Enginemen	700	...	Advance of 1d. per day (5s. 7d. to 5s. 8d.)
			Firemen	250	...	Advance of 1d. per day. Wages after change: Winding Enginemen, 4s. 9d. Hauling and Pumping Enginemen, 4s. 8d.
		5 & 12 Mar.	Mechanics	1,600	...	Advance of 1 per cent. on standard rates, making wages 13 per cent. above the standard of November, 1879.
Quarrying	Cleveland and Durham	15 Jan.	Ironstone Miners	6,800	...	Advance of 1d. per day (4s. 5d. to 4s. 6d.)
	Weardale	15 Jan.	Limestone Quarriesmen	1,500	...	Advance of 1 8125 per cent. on standard rates, making wages 24 3 per cent. above the standard of 1879.
Pig Iron	Cleveland and Durham	9 Jan.	Blasfurnacemen	5,500	...	Advance of 1 8125 per cent. on standard rates, making wages 24 3 per cent. above the standard of 1879.
Iron and Steel	Northumberland, Durham and Cleveland	29 Jan.	Puddlers... ..	750	...	Advance of 1½ per cent. under sliding scale, leaving wages 16½ per cent. above the standard.
	Easton	7 Jan.	Iron and Steel Millmen	2,650	...	Advance of 3d. per ton (8s. 10d. to 8s. 13d.) under sliding scale.
	Midlands (incl. 102 parts of S. Yorks & S. Lancs.)	5 Feb.	Steel Workers	1,305	...	Advance of 2½ per cent. under sliding scale.
			Ironworkers — Puddlers Millmen	20,000	...	Advance of 3d. per ton (8s. 6d. to 8s. 9d.)
	West of Scotland	24 Jan.	Steel Millmen	3,500	...	Advance of 2½ per cent.
Engineering and Shipbuilding	North-East Coast	1st day Jan.	Gas, Producermen and Charge Wheelers	977	...	Advance of 2½ per cent.
			Enginemen and Cranemen	1,359	...	Advance of 2½ per cent. on piece rates, and of 1s. 6d. per week on time rates.
			Engineers and Machinemn	15,800	...	Advance of 2½ per cent. on piece rates, and of 1s. 6d. per week on time rates.
		Mar.	Boilermakers in Engineering Works	2,950	...	Advance of 5 per cent. on piece rates, and of 1s. 6d. per week on time rates.
			Rivetters and Caulkers in Shipyards	8,250	...	Advance of 5 per cent. on piece rates, and of 1s. 6d. per week on time rates.
	E. Linburl and Louth	12 Jan.	Holders up in Shipyard	1,650	...	Advance of 5 per cent. on piece rates, and of 1s. 6d. per week on time rates.
			Engineers	700	...	Advance of 5 per cent. on piece rates, and of 1s. 6d. per week on time rates.

## Our Weekly Review—continued.

(Continued from page 411.)

each case has been considerably increased per mill. These circumstances of necessity will have to be considered, as without some improvement in the demand the make will have to be curtailed and it is reported that there are several works which have come to the conclusion that there is no other remedy than to stop the mills in preference to continue working at a loss.

**High Price for Raw Materials.**—The high price of raw materials for the manufacture of tinplates has not so far caused a stoppage of any mills, though notices on that account are running out at two large Llanelli works. The number of mills at work at the end of December was 417, 10 more than at the corresponding period of last year, and two less than at the end of January of this year.

**Newport Dock Extension.**—A good deal of development work is proceeding at Newport Docks. The new quay of the South Lock, which was brought into use in June last has greatly facilitated the operations of the company, while the improvement in the lighting of the South Lock, where the flame arc lamp is used, has been of great benefit to boats using the dock. The work now in hand is the South Dock extension, for which powers were obtained in 1904. The work consists in the excavation of a dock about 3,000 ft. long by 1,000 ft. wide, and about 30 ft. deep on the south side of the existing South Dock and the erection of four coal hoists with sidings, together with the diversion of the River Ebbw. The total quantity of earthwork to be excavated is between four and five million tons, and of this quantity about three-quarters of a million tons have to be excavated for the new bed

of the River Ebbw. The existing River Ebbw will be closed up, when the new channel has been formed, by large earth dams. No fewer than about 150,000 tons of stone will be used on the dock slopes, while about 300 tons of steelwork will be required for the steel viaducts leading to the new coal hoists. In order to deal with the large amount of excavation it has been necessary to lay down about ten miles of temporary railway. The new dock will be in service about the middle of next year. When completed the total dock area of the company will be more than 100 acres, and the equipment of the docks will be absolutely modernised. Some difficulty was experienced in completing the ferro-concrete wharf adjoining the North Lock in consequence of difficulties in maintaining the stability of the river bank during construction, but these have now been overcome. Parliamentary powers are being sought for a new deep-water entrance lock 1,000 ft. long, capable, of course, of admitting the largest vessel afloat. The lock being in two compartments, will permit of docking and undocking for a much longer range of tide than is possible with existing locks. Messrs. Easton, Gibbs and Son are the contractors, and Sir John Wolfe Barry and Partners the consulting engineers.

**Swansea Harbour Trust.**—The usual comparative statement of trade for the year 1905 shows that the tonnage, both imports and exports, again constitutes a record, and taken together is 212,116 in excess of last year. The export of coal increased 200,000 tons, but patent fuel fell off to the extent of 43,702 tons. The shipments of anthracite to San Francisco were less by 13,895 tons. The export of tinplates exceeded 300,000 tons, being 20,000 tons more than last year. In the imports, iron ore shows an improvement of 2,000 tons and grain of nearly 10,000 tons. The construction of the new dock is making rapid progress.

## Ireland.

### BELFAST.

**Engineers' Strike Averted.**—The proposed strike of Belfast engineers has been averted. A mass meeting of the men was held on Thursday night in private, and the decision arrived at was that the strike notices should be withdrawn and work proceed as usual. Great satisfaction is felt locally at the men's decision.

**Shipyards Labourers' Wages.**—The members of the National Amalgamated Union of Labourers employed at Belfast shipyards yesterday applied for 5 per cent. increase on the present rate of wages for men engaged on piece work, and one shilling per week for other employes. The masters are given to March 14th to consider the questions.

**A Fifty Hour Working Week.**—Messrs. Davidson and Co., Ltd., of the Sirocco Works, have made a new departure in regard to working hours. They have voluntarily conceded a fifty hours' working week instead of the present fifty-four hours, and this without any reduction in wages. Messrs. Davidson believe that

they themselves will be no material losers by the concession, which is to come into operation on 2nd March.

**Belfast Tramways.**—The Cavhill and Wheelall tramways which have been converted to electricity, were formally inaugurated last week. Messrs. J. G. White and Co. were entrusted with the electrification and equipment of the system, which is about three and a half miles in length. The cars are built upon radial tracks by the Brush Electrical Engineering Co. Ltd., who were also responsible for the electrical equipment.

**Belfast Harbour Board.**—The annual report of the Belfast Harbour Commissioners issued last week states that the registered tonnage of shipping cleared from the port during the past year reached the record figure of 2,364,365 tons. Twenty-two vessels constructed in the shipbuilding yards in the harbour, amounting to 671 tons gross, and 5,825 tons net, were launched during the year.



# United States.

**Latest Advices.**—Latest Pittsburg advices state that during the past week all kinds of iron have become weaker owing to the heavy production and speculators holding some of their recent purchases. This has caused a unsettled feeling in the trade and there is less disposition to operate for forward delivery. In finished steel the chief features have been the placing of orders for about 22,000 tons of rails, while farther orders for another 20,000 tons are still pending. Heavy structural contracts have been booked, and are under negotiation, and the business for all kinds of machinery is reported good.

**The Seven Day Week.**—The steel markets remain active and production remains at a maximum. There is a feeling, however, that the seven days' week should be given up, and in the Western districts it is stated that Sunday work is to be discontinued in many of the big shops. As a matter of fact this plan has been tried in Europe and found wanting, the experience being that the men can only do good work under such exhausting conditions for a comparatively short period, so that there is nothing whatever gained. The volume of trade from Canada is increasing for heavy steel wares and for sheet steel, plates, pipe, nails and wire. The Grand Trunk and Canadian Pacific Railways are accumulating material for extensive additions to tracks and bridges, and are asking for early delivery.

**The Monthly Statistics of Pig Iron,** published by the Iron Age, show a record-breaking production for the month of January at 2,059,000 tons, the weekly production capacity on February 1st being 483,000 tons, to which have to be added 30,000 tons of charcoal iron. The Steel Trust has now only two furnaces blown out, out of a total of 89. The market has been steady during the week with the undertone strong, but with no recurrence of the recent heavy buying. While some mills are still making more orders than they are delivering the premiums on early delivery are gradually disappearing. Any accumulation of tinplates wire products, and pipe, is impossible under present conditions. The Steel Corporation has the whole of its blast furnaces operating. The business in structural steel is on an unprecedented scale. The Pittsburg territory will require 100,000 tons and New York 200,000 tons of steel for the building operations projected. Railroads are placing supplementary orders for rails. Pig iron has been quiet with some activity in the Chicago district and the Steel Corporation has bought 15,000 tons for forward shipment there. Apart from the possibilities of a tie-up in the ore situation through strikes, the ore shipping season promises to open early.

**American Pig Iron in 1905.**—The production of pig iron in the United States last year, as reported by the American Iron and Steel Association, was the largest in the history of that industry. The report shows that the total production in 1905 was 22,042,780 gross tons against 17,173,383 tons in 1904, 18,072,232 tons in 1903 and 17,813,377 tons in 1902. In classifying the production, the report states that 11,407,119 tons of Bessemer and low phosphorus pig iron were produced in 1905, as against 9,078,614 tons in 1904, an increase of over 25 per cent. The production in the first half of last year was 11,283,145 tons, and in the second half 9,759,635 tons.

## Threatened Strike of Anthracite Miners.

If a report just issued is well founded a miners' strike is almost inevitable. It is stated that the committee of 150 representatives of the anthracite miners which has been meeting in the city has finally decided to demand an eight hours work day, and that this demand will be presented at a conference between the miners' representatives and a similar committee of owners which is to be held in New York this week.

## Scarcity of Ferro-Manganese.

The scarcity ferro-manganese famine is becoming accentuated. There is very little in the hands of sellers or buyers. One of the largest selling agencies is reported to be quoting 120 dollars a ton for delivery in the States during the second half of 1906. The bulk of the manganese ore used for ferro-manganese is mined in Sharopan and Kantar, Russia, where 70 million tons are workable at shallow depths. The manganese is taken by a narrow-gauge road to the Trans-Caucasian Railway to Poti and Baku, on the Black Sea. The reason for the scarcity within the past year may be traced to the war. The shipping output of manganese from Caucasian mines has been reduced about 75 per cent.

## New Steel Works.

The New York Tribune is the authority for stating that a large new steel plant is about to be erected in Indiana State by the Illinois Steel Company, one of the subsidiary companies of the United States Steel Corporation. There will be 27 blast-furnaces and 50 open-hearth furnaces, making it, the Tribune says, the largest steel plant in the world. The new plant will cost ultimately from £5,000,000 to £7,500,000, and will require ten years in building.

## American Imports into Germany.

Much satisfaction is felt in Washington at the intelligence that the German Government will introduce in the Reichstag, within a few days, a Bill granting tariff concessions to American imports into Germany for a limited period. With the exception of slight concessions regarding the freer entry of German goods with reference to their appraisement, Germany has made the concession without reciprocal treatment from America. Under these circumstances the threatened tariff war will be averted.

## The Panama Canal.

President Roosevelt has transmitted to Congress the report of the Isthmian Canal Commission upon the type of waterway to be adopted for the Panama Canal. The President recommends a lock canal which he declares can be constructed in less time than one at sea-level. The initial expense would be smaller, as would the cost of operating and maintaining the canal. Final decision on the subject rests upon Congress.

## United States Ships' Subsidy Bill.

The Senate has passed by 38 votes to 27 Mr. Gallinger's Shipping Bill to promote the national commerce, create a naval volunteer force, establish American trade in foreign markets and provide revenue from commerce.

## The Dry Dock Dewey.

The Navy Department is still without any news of the great dry dock, which is now on its way to the Philippines via the Straits of

Gibraltar; but, though a little uneasy, the officials say no fears for its safety are at present entertained.

#### Later.

As we go to press the dry dock is reported to have arrived at Las Palmas.

**Heavier Battleships Proposed.**—The New York Herald's Washington correspondent says Chief Constructor Capps has made a recommendation to the Navy Department that the tonnage of the next battle ship shall be increased from the 16,000 standard to 20,000 tons. The recommendation is a direct outcome of the recent launching of the British battleship *Dreadnought*.

**Franklin Institute.**—The Franklin Institute, Philadelphia, at its annual meeting elected as president, John Birkinbine, the vice-president being James M. Dodge, and the secretary Wm. H. Wahl.

**Proposed Visit of Electrical Engineers.**—The American Institute of Electrical Engineers has received from the Institution of Electrical Engineers of

Great Britain a cordial invitation to the American Institute of Electrical Engineers to visit England during the latter part of June next. A similar invitation has been received from the Associazione Elettrotecnica Italiana, to visit Italy during the season of the Industrial Exhibition at Milan, beginning May 1st, 1906. These invitations are in acknowledgment of the courtesies extended to both organisations by the A.I.E.E. It will be remembered that large representative bodies from both these societies took part in the circular tour on the occasion of the International Electrical Congress at St. Louis, September, 1904, and participated in a joint meeting at St. Louis. Both of the proposed tours will embrace visits to important electrical plants, educational centres, and scenic features of these countries. The Italian trip would necessarily either immediately precede or follow the visit to England, in all probability during the month of May. Members of the institute have been asked in a circular to notify the secretary as to their intentions in the matter.

## Colonial.

**Cape to Cairo Railway.**—Sir Charles Metcalfe, who has returned to England from Central Africa, states that early in January the rails of the Cape to Cairo line reached the Kafue river, 260 miles beyond the Victoria Falls, and at this point a bridge 1,600 ft. long is being constructed, to cross the stream beyond the Kafue. The earthworks are nearly finished for a further distance of seventy miles, so that the line may reach the Broken Hill zinc and lead mines by June.

**New South Wales Mineral Output.**—The mineral production of New South Wales for 1905 was valued at £7,017,042, showing an increase of 40.26.170 as compared with 1904, being the largest output in the history of the State. The year's gold yield amounted to 274,267 oz. fine, valued at £1,165,013, being an increase of 4.450 oz., valued at £18,904, as compared with 1904. The exports of silver, lead, and zinc were valued at £2,717,864, being an increase of £468,382, as compared with 1904. The copper output amounted in value to £331,754, being an increase of £108,753. The tin exports were valued at £173,800, being an increase of £4,571. The coal output amounted to 6,632,438 tons, valued at £2,003,401, being an increase of 6.232.9 tons.

**Canadian Tariffs.**—Mr. Fielding, the Canadian Minister of Finance, has received a memorial from the Executive Committee of the Canadian Manufacturers' Association urging that preference should only be granted to goods arriving in Canada direct, and that all other goods shall be subjected to full tariff charges. They contend that if all the goods on which preference is allowable are made to come direct it will mean the building up of the Canadian ports on a strong and successful basis.

**Canadian Society of Civil Engineers.**—The annual convention of the Canadian Society of Civil Engineers opened at Toronto on January 30th. The

Council's report showed a substantial increase in membership, the number being 1,389, as against 1,261 in 1904. The Gzowski medal award for 1904-5 was awarded C. B. Smith, M.E., for his paper on the construction of the Canadian Niagara Power Company, 100,000 h.p. hydro-electric plant at Niagara Falls.

**The Rand Mines.**—As shown by the report of the Mines Department, the mineral output of the Transvaal for the month of December was valued at £1,970,359 in respect of gold, coal, diamonds and silver, and for the year 1905 at £22,698,275. Compared with November, an increase of 43.085 is to be noted. Eighty-seven mines were dropping stamps during the month, whilst twenty works, etc., other than mines were producing. The total number of stamps at work was 7,294. Of these 6,010 were at work on the Rand. In all, 1,041,092 tons were milled for a return of 71,837 8oz. Development work undertaken during the month was 3,177 ft. less than that carried out during November. For the year ending June 30th, 1905, the value of the total mineral output of the Transvaal was £20,878,941.

**Fire at the Broken Hill Mine.**—Fire broke out in this mine on Saturday evening last, on the 400 ft. level, 150 ft. to the north of the McBoyde shaft. Every effort has been made to localise the fire, a sandbag barrier has been completed, and a brick wall is in course of erection in order to confine the area. The miners have been withdrawn up to the present. The general manager has reported that if he succeeds in containing the area he expects to resume operations during the midnight shift. The only fear is the possibility of the extension of the fire upwards through the worked-out stopes, which occupy the ground above and are heavily timbered. Operations are proceeding satisfactorily, there being practically no smoke in the mine. The general manager's latest report is that there is every hope that the fire is now under control and are contained.



# Continental.

BERLIN.

**The German Steel Union.** At the last meeting of the German Steel Union it was reported that business in half-finished material continues good. The pressure for delivery on the part of home consumers is so great that the works have a difficulty in satisfying their requirements. The foreign demand for half-finished goods, especially for Belgium, is very active, and it would have been possible to sell considerably larger quantities at profitable rates had not the union decided to restrict sales abroad in order to satisfy the home demand. Business with England has quietened somewhat, but conditions are healthy. In railroad material the turnover is satisfactory, and the mills are well occupied. Some large orders have been booked for furrow rails, but rails for mining purposes are quiet. A number of orders for foreign account at higher prices have been received.

**The New Commercial Treaties.**—Count von Posadowsky, Secretary of State for the Interior, received the members of the German trade conference at Berlin on Monday. He stated that in a few days new commercial treaties with eight continental States would come into force. He was glad to say that, in this period of transition, industry and commerce were showing marked signs of renewed progress. Unfortunately, they had not succeeded in concluding a new political commercial arrangement with the United States. Should Germany decide by a one-sided legislative Act to lend her aid to secure the undisturbed continuance of existing commercial relations with the United States that could only be due to the expectation that the way for an arrangement was being found. In spite of increased demands for useful and artistic articles of luxury, and practical, durable and cheap necessities of life, German

industry had been showing progress. German machinery and chemists had captured the markets of the world. German industry, the Count continued, was all the more entitled to be proud of the fact, seeing that there was not such a mass of raw material as Germany's disposal as was the case with other countries. The lack of a rich soil and favourable climatic conditions were made good by German creative faculty. The arrangement provides that the Federal Council is authorised to grant to the United States for a period from February 1st, 1906 to June 30th, 1907, the same tariff rates as are accorded to Belgium, Italy, Austria, Hungary, Russia, Rumania, Switzerland and Serbia by commercial treaties with those countries.

**Liège International Exhibition.**—This exhibition was visited by 674,357 persons. The receipts enabled 84 per cent of the fund guaranteed to be returned. The Fine Arts building and the three new bridge, over the Meuse become the property of the city of Liège.

**Coal Trade.**—The following information regarding the importation of coal into Italy is of interest. As an indication of the development of Italian manufacturing industries it appears from the Customs Returns, that during the first six months of 1905 Italy imported 2,070,000 tons of coal showing an increase of 187,000 tons, as compared with the corresponding period of 1904. At the same time, it should be noted, that in 1904 there was an increase of 273,000 tons over 1903, that 1903 exceeded 1902 by 172,000 tons, and the imports in 1902 were greater than those in 1901 by 150,000 tons. In fact the consumption of coal in Italy during the last five years has augmented by 1,695,000 tons, or 38 per cent.

## Egypt.

**Steam Driven Ploughs.**—Cattle were always scarce in Egypt in proportion to the population of the country and to the extent of land under cultivation. Of late, however, the scarcity has been even greater, owing to the ravages of the cattle plague. In consequence of this there has been a marked development in the adoption of agricultural machinery propelled by steam. Such machinery has already been in use for some time on the Government farms and on some of the larger estates. There is also an increased demand for new models of light motor-driven ploughs. The more important agriculturists here ask for motor or steam-driven ploughs working swiftly and burrowing deeply into the soil as well as treading the surface. They do not so much mind what price they pay for their machinery so long as they get what will answer their requirements. The ploughs for this class of work should be very strongly made, and of high power. On the other hand there is also a demand for smaller steam-driven ploughs for use by the less important farmers. These require a light but very strong and one-two plough easily carried from place to place, and which can be easily worked by the natives who for the most part are poor in the handling of machinery, and can by no means be termed experts. There ought some day to be a good market here for ploughs driven by motor or steam and good work on a fairly large scale. Rice is not yet being produced on a large scale in Egypt.

quantities and it can be bought at a very low price. Up to the present time steam-driven ploughs have given better results in this country than those with explosion motors.

**Steam Engines.**—Steam engines, fixed and portable are coming into Egypt in larger quantities year by year. Whereas the total imports of these during 1901 were 247 tons they were £84,749 in 1902, £169,613 in 1903, and they rose to £214,177 in 1904. Nearly three-quarters of this business is in British hands, the remainder being shared by France, Holland, Switzerland, Germany, Italy, the United States, and Belgium.

**Terms of Credit in Egypt.**—The enormous amount of which large sums were made in just a few years, under the stress of competition very keenly, and credits have increased accordingly. Formerly the terms in payment were, say, one-third of the purchase money with the other one-third after six months from delivery, and the remainder by a twelve months' bill. During the last two or six years these facilities have greatly increased until now the buyer has anything from six to nine months in which to pay the first one-third, and from twelve to eighteen months for the balance. In several cases payment is extended for a long time, but in such instances interest from 7 per cent to ten per cent is charged.

# Contractors' News.

This list only contains contracts, particulars of which have not been previously published. For particulars of other contracts, see recent issues of "Page's Weekly," and small advertisements, pages 6 and 7. We shall be pleased to insert under this column, free of charge, particulars of open contracts.

## Contracts Open.

### United Kingdom.

	Last Day.		Last Day
<b>Aberdeen.</b> —Laying of permanent way and relative can-ewaying work for the dock railways, for the Aberdeen Harbour Commissioners. Mr. R. Gordon Nicol, engineer, Harbour Engineer's office .. .. .	Feb. 29	<b>Newton-in-Makerfield.</b> —Annual supplies, including wrought-iron tubes, etc., for the Urban District Council stores. Stores clerk, Earlstown Gasworks .. .. .	Mar. 3
<b>Bristol.</b> —Tenders for arc lamp carbons. Mr. H. Faraday Proctor, city electrical engineer .. .. .	Mar. 6	<b>Pontypridd.</b> —Reservoir, condensing plant, cooling tower and tank, and artesian well for the urban district council .. .. .	Mar. 3
<b>Chatteris.</b> —Water supply works for the Chatteris Urban District Council. The works include about 6½ miles of 7 in. cast-iron main pipes, and about 3½ miles of smaller mains and fittings; also a brick and slate meter-house and meters. Mr. Alfred Giddins, clerk .. .. .	Mar. 1	<b>Portsmouth.</b> —Supply of water-tube boiler, economiser, feed pumps, surface condenser and cooling tower, and triple-expansion 1,000 k.w. generating set for the Corporation .. .. .	Mar. 3
<b>Croydon.</b> —Corporation wants tenders for coal for the electricity works .. .. .	Feb. 28	<b>Padiham.</b> —Supply and delivery of cast-iron pipes, viz. 111 yards of 6 in., 120 yards of 4 in., and 222 yards of 3 in., for the Padiham Urban District Council. Mr. J. Gregson, A.M.Inst.C.E., district engineer, Padiham .. .. .	Mar. 3
<b>Dublin.</b> —The Commissioners of Public Works, Ireland, invite tenders for electrical works and supplies at buildings in Dublin and its vicinity. Mr. H. Williams, Office of Public Works, Dublin .. .. .	Mar. 1	<b>Rotherham.</b> —Supply and fixing a Lancashire boiler for the corporation. Mr. W. J. Board, town clerk .. .. .	Feb. 28
<b>Halifax.</b> —Supply of stores and materials for the Corporation electricity tramways and highway departments, including electrical supplies, tools, ironmongery, engine-room stores, etc. .. .. .	Feb. 29	<b>Sheffield.</b> —Supply and erection at the United Gas Light Company's Neepsend Station of a steel roof 293 ft. long by about 57 ft. span, together with the raising of the two existing side spans, one of which is 293 ft. long by 17 ft. 10 in. and the other 145 ft. long by 17 ft. 6 in. the whole forming part of the roof over the No. 2 Retort House. Mr. John W. Morrison, Commercial Street .. .. .	Mar. 6
<b>Halifax.</b> —Supply and erection of a rotary exhaustor and horizontal engine the exhaustor to be capable of dealing with 150,000 cubic feet of gas per hour, for the Gasworks Committee. Mr. John Wilkinson, F.C.S., engineer, Gasworks, Halifax .. .. .	Feb. 28	<b>Shoreditch (London).</b> —Tenders for stores for one year ending March 31st, 1907, including electric cables and sundries, gas pipes and fittings, and engineers' stores. Town clerk, (Dr. H. Mansfield Robinson), Town Hall, Old Street, E.C. .. .. .	Mar. 13
<b>Halifax.</b> —A 30-35 b.h.p. motor tower wagon for the tramways department. Borough Electrical Engineer, Foundry-street .. .. .	Feb. 27	<b>Steventon.</b> —Widening portions of the line between Steventon and Didcot and between Wantage Road and Challow (total length about five miles), for the Great Western Railway Company. New Works Engineer, Paddington Station .. .. .	Feb. 27
<b>Hornsey.</b> —The town council invite tenders for cables and cable fittings .. .. .	Feb. 26	<b>Sunderland.</b> —Supply of six vestibule cars (double-deck top-cover type) with approved radial trucks. Mr. John F. C. Snell, M.Inst.C.E. Town Hall .. .. .	Mar. 3
<b>Horwich.</b> —Sludge pressing machinery and sewage purification works for the Urban District Council. H. L. Hinnell, 41, Corporation-street, Manchester .. .. .	Feb. 27	<b>Warrington.</b> —Supply of the following materials for twelve months from April 1st for the Water Committee, (Section No. 1) pipes, castings, valves, hydrant covers, etc.; (No. 2) bit, stop, and ball-cocks, ferules, etc.; (No. 3) oils. Water Engineer, Municipal Offices, Sankey Street .. .. .	Feb. 24
<b>Londonderry.</b> —Supply of materials for the electricity department for one year from April 1st, 1906, including carbons, meters and demand indicators, bitumen and box compound, cables, boxes and troughs and house fuse boxes. The electrical engineer (Mr. R. V. Macrory), Strand Road, Londonderry .. .. .	Mar. 3		



	Last Day		Last Day
<b>Warrington.</b> Supply of 100,000 lbs. of iron wire for the Corporation. Mr. W. S. Huggins, 10, Church Street, Warrington.	Mar. 1	<b>Denmark.</b> The Royal Danish Commission for the works of the 1899-1900. Tenders for the supply of 100,000 tons of coal in accordance with the conditions which may be obtained from the State of the Government. Director of the Copenhagen Lighting Department, 28, Vestergade, Copenhagen.	Feb. 2
<b>West Ham.</b> Supply of 100,000 lbs. of iron wire for the Corporation. Mr. W. S. Huggins, 10, Church Street, Warrington.	Mar. 2	<b>Johannesburg.</b> Supply of 100,000 lbs. of iron wire for the Corporation. Mr. W. S. Huggins, 10, Church Street, Warrington.	Mar. 2
<b>West Hartlepool.</b> On the new high-speed engine and continuous current dynamo for the Corporation. Chemical Electric Lighting Committee.	Feb. 26	<b>Klagenfurt.</b> The Austrian City Council tenders for the construction of a concrete railway bridge for the supply of water works, also electric lighting and section and crossing pumps. The Gemeinderatssekretariat-Klagenfurt.	Feb. 2
<b>Weston-super-Mare.</b> Extension of the steam heating apparatus at the Locking road Council Schools, Weston-super-Mare, for the Education Committee of the Somerset County Council. Messrs. Price and Jane, Weston-super-Mare.	Feb. 24	<b>Lisbon.</b> Construction of a new bridge (about 1,120). Director of Public Works, 1, Rua do Carmo, Lisbon.	Mar. 24
<b>Abroad.</b>			
<b>Antwerp.</b> For the provision of heating apparatus for the New Flemish Lyrical Theatre. Guarantee, 6,000 francs. Specification and plans to be had from the secretary, Town Hall, Antwerp.	Mar. 2	<b>Madrid.</b> —Supply of 35,000 zinc cylinders for Galland pipes. Director of Public Works, Carretas, Madrid.	Mar. 2
<b>Antwerp.</b> Construction of clock at Malines, estimated cost, £45,525. Rue des Augustins 15, Brussels.	Mar. 14	<b>Madrid.</b> Construction of a new railway from Val de Zafra to Badajoz. Carlos de la Rapita.	Mar. 14
<b>Brussels.</b> —Raising the dams of the Charleroi-Brussels Canal, at the estimated cost of 80,093.52 francs. Direction du Special Service des Canaux Houilliers, Rue de Louvain 4, St. Gilles.	Feb. 24	<b>Madrid.</b> The Spanish Government of Publicas invite tenders for a new railway project in Barcelona.	Mar. 14
<b>Brussels.</b> Supply of 100,000 lbs. of iron wire for locomotives. M. de Rudder, Administrateur des Voies et Travaux, 11, Rue de Louvain, Brussels.	Mar. 7	<b>Madrid.</b> Construction of a new railway from Madrid. Director General of Public Works.	Mar. 14
<b>Brussels.</b> —Works at Onoz, including three steam engines and pumps. Compagnie Internationale des Eaux de l'Agglomeration Bruelloise, Rue du Trone 48.	Mar. 14	<b>Manila.</b> Construction of two steel bridges. Harbour Works Manager.	April 2
<b>Bulgaria.</b> —Tenders will shortly be opened at the Ministry of War, Sofia, for the construction of a canal between the lake of Devna and the port of Varna, at the estimated cost of about 75,400.		<b>Montevideo.</b> Complete installation of a lighthouse of Montevideo lighthouse, of nine gaslit buoys, and of gas works. Ministerio de Fomento.	Mar. 14
<b>Christiania.</b> —Supply to the Norwegian State Railways of 200 truck tarpaulins and 1,900 metres of hemp cloth of various widths.	Mar. 2	<b>Muenster.</b> —Supply of electric light and power equipments to the Westphalian Railway. Director of the State Railways.	Mar. 6
<b>Copenhagen.</b> Supply of 100,000 kilos. of copper wire, 21,000 kilos. of sulphate of copper, 28,000 insulators, and other articles for the use of the Telegraph Administration. Engineer's Department of the Administration, 28, Frederiksborgs Kanal, Copenhagen.	Feb. 26	<b>Netherlands.</b> The Netherlands Colonial Office at the Hague require tenders for the supply of the following materials: Contract No. 11, 12, 22, 770 kilos. of heavy iron, 18,940 kilos. of "Zorès" iron. Contract No. 113, 20,000 kilos. of zinc-coated steel, thickness 3 mm., 70,000 kilos. of zinc-coated steel wire, thickness 3 mm., Contract No. 11, M. 12.—1,000 kilos. of silicon bronze wire, thickness 1 mm. Contract No. 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.	Feb. 28

- Norway.**—(1) Supply of 6 metres gauge transport material to the western portion of the Bergen State Railway as follows:—Wheels and bearing boxes (cast, turned wheels with 50 m.m. wheel diameter, 60 m.m. steel axles with 50 m.m. outside pivots and accompanying two bearing boxes for roll bearings, 30 axles). Wheels with axles but no bearing boxes, 15 axles. The material is to be delivered c.i.f. Bergen, duty paid. (2) Supply of tools and sundries. "Overingeniörens Kontor, Vossevangen." (3) Supply to the Norwegian Naval authorities of 371 doz. files of various descriptions. . . . Mar. 1
- Paris.**—The Municipality require offers for a concession of the electrical undertaking of Paris. M. de Pontich, director of works, Hotel de Ville, Paris. . . . Mar. 1
- Pretoria (Transvaal).**—Supply and erection of a refuse destructor, for the municipality. Messrs. Mosenthal, Sons and Co., 72, Basinghall Street, E.C. . . . Mar. 15
- Pilsen.**—The Austrian State Railways invite tenders for the electric lighting of the station in Pilsen. . . . Mar. 6
- Rosario.**—Public electric lighting. Municipal authorities, Rosario, Argentine. . . . April 16
- Sydney (New South Wales).**—Supply and erection of (a) boilers, automatic stokers, pipework, etc.; (b) turbo-alternator, sub-station machinery, switchboards, etc. Town Clerk. . . . May 7
- Talcahuano.**—Construction of floating steel dock of 1,000 tons displacement. Direccion del Material, Valparaiso. . . . May 1
- Terralba (Italy).**—Municipal waterworks. Estimated cost, £7,700. . . . Mar. 8
- Valparaiso.**—Harbour works, estimated cost 33,140,760 pesos. Minister of Finance, Santiago. . . . April 25
- East Ham.**—An inquiry will shortly be held into the application of the Council for sanction to borrow £18,000 for electric lighting extensions.
- Hanley.**—The Council have decided to purchase a crusher, mortar-mill, etc., for the destructor works.
- Hebden Bridge.**—The Council are applying for £2,500 for extension of the electricity works. The money is required for laying down additional cable.
- Hereford.**—Sanction to a further loan of £4,000 for cable extensions has been obtained.
- Hexham.**—The Council have decided to purchase a new steam engine and appliances, and are making application to the Local Government Board for sanction to borrow the sum of £100 for the cost of the same.
- Islington.**—The Borough Electricity Committee are recommending the purchase of six mechanical stokers at a cost of £300 each.
- Lincoln.**—The Electricity Works Committee recommends the Town Council to borrow £13,000 for additions and extensions at the electricity works and for cables. The additions to the works include a boiler, £1,000; a 500 h.p. steam dynamo, £2,500; distributors, £6,000; feeders, £12,000 and conduits, £3,000.
- Llanelli.**—The new traction scheme is estimated to cost over £70,000.
- Lincoln.**—The city council, at a special meeting on Monday, decided to revise their application for a loan to carry out water supply extensions from 188,000 to £200,000.
- Prussia.**—The Prussian State Railways will shortly place orders for 1,000 new locomotives. A portion of these, to the number of 540, have already been contracted for and are to be delivered by November 1st next. The total value of the new locomotives will amount to about £1,000,000.
- Roumania.**—The Municipality of Hitesci will shortly invite tenders for the establishment of an electric lighting system in that town.
- Sheffield.**—Messrs. Samuel Fox and Co. Ltd., of Stocksbridge, contemplate extensive improvements to their steel plant. The amount to be spent is estimated at £125,000.
- Southam.**—The Local Government Board have inquired into the application of the Wychcombe Rural District Council for sanction to borrow £3,000 for sewage disposal works.
- Spain.**—A Royal Commission has been appointed to report on the most efficacious and speedy means of establishing a submarine cable between Cadiz and Santa Cruz. The Government have been authorised to grant a concession to construct and work a narrow gauge steam railway from Vilches, on the Córdoba-Málaga line, to Baños de la Elna.

## Coming Contracts.

- Australia.**—It is proposed to construct a 3 ft. 6 in. gauge railway in West Australia from Port Hedland to Nulligane. The work will probably be undertaken by the West Australian Government.
- Cardiganshire.**—The County Council have further considered a scheme for constructing a light railway between Lampeter, Aberayron and New Quay, and a vote to advance £20,000 has been carried.
- Dover.**—Sewage works are to be carried out at a cost of £3,000.
- Dundee.**—The Corporation have under consideration the question of electrical extension on a large scale, involving an expenditure on a new power station of £75,000.



**Stepney.**—The electric supply company has applied for a loan of £100,000 for the purpose of extending the lighting system.

**Stratford-on-Avon.**—A Local Government Board inquiry was held last week respecting an application of the corporation to borrow £10,000 for purposes of extending the lighting system, which was disposed of.

**Turkey.**—The Imperial Government proposes establishing important engineering works, probably at Damascus, in connection with the railway.

**West Hartlepool.** The Town Council have sanctioned a loan of £10,000 to the extent of £5,000 for electric lighting purposes.

**Walsall.** The Corporation have been asked to apply for sanction for a further loan of £10,000 for extensions of the lighting plant and mains.

## Contracts Closed.

**Ballaghaderreen (Ireland).**—The Castlereagh Rural District Council have accepted the tender of Messrs. James Gordon and Co., of 52, Lime Street, London, E.C., for the hydraulic turbine, gas engine, and suction plant, forming the complete power equipment of their electric lighting station, subject to the necessary loan being granted by the L.G.B.

**Glasgow.** The Associated Portland Cement Manufacturers Ltd., have placed an order with Messrs. William Beardmore and Co., Ltd., Glasgow, for seven Oechelhauser gas-engines, each of 400 b.h.p., together with the necessary gas producers of the Mason type, with all necessary plants and accessories.

**Manchester.**—Messrs. Royce, Ltd., have just received an order from Messrs. Ruston, Proctor and Co., Ltd., of Lincoln, for four three-motor electrically-driven overhead travelling cranes for use in the new gas engine department.

**Rugby.**—The British Thomson-Houston Company, Ltd., have secured a contract from the Birmingham Corporation for ninety 5 amps. fixed frame continuous current series multiple enclosed arc lamps with self-contained electrical resistance.

**Shipbuilding Contracts.**—Messrs. Ranby and Ferguson, Leith, have received in order to build two first-class yachts for American owners. Messrs. Lobnitz and Co., Renfrew, have received in order to build a motor tug for the Natal. Messrs. Murdoch and Macdonald, Glasgow, have received instructions to build a light draft steamer for service on the River Argyll. Messrs. John Cran and Co., Leith, have booked in order to build a steam trawler for Aberdeen owners. Messrs. John Fullerton and Co., Paisley, are to build a 1,000 ton steamer for the coasting trade. Messrs. Swan Hunter and Wigham Richardson, Newcastle-on-Tyne, have booked an order for a 5,000 ton steamer for London owners. Sir James Laing and Son, Sunderland, are to build a 1,000 ton steamer for a Marseilles firm.

**The Clyde.** Messrs. Henry Pooley and Son, Ltd. are installing for the Clyde Trustees four automatic weigh bridges for use in connection with the electrically operated funiculars building for the Clydebank Dock.

**Leeds.** The tender of Messrs. Farnet, Walker and Co. for the erection of a hybrid cooling hoist at the Canada branch Dock, Liverpool, at a cost of £7,533 has been accepted by the Mersey Dock Board.

## Appointments Vacant.

**India.** The Secretary of State for India in Council will, in the summer of 1900, make not less than ten appointments of assistant engineers in the permanent establishment of the Indian Public Works Department, in addition to the appointments to be made from Cooper's Hill College. The age of candidates must not be less than 21, or more than 24 years on the 1st July, 1900.

May

**London.**—Two assistants are wanted in the electrical engineering department of the Central Technical College, Exhibition Road, S.W. Salaries £300 and £150 per annum respectively. Prof. W. E. Ayrton, F.R.S.

**Newcastle-on-Tyne.**—The council of Armstrong College, will shortly appoint a professor of electrical engineering. Stipend £2,500 per annum and one-third of fees until £750 in all is reached. Secretary, Mr. F. H. Pruett.

March

## Appointments Filled.

**Chatham.**—Major G. F. H. Le Breton Simmons, R.E., has been appointed chief instructor at the schools of electric lighting, Chatham, and Lieut. P. S. Watkins, R.E., is to be assistant instructor.

**India.**—Mr. J. Hughes, of Crewe, has been appointed metallurgist under the Bombay, Baroda and Central Indian Railway.

**Leeds.**—Mr. B. Frankland, who has been in the service of this municipality for fifteen years, has been promoted chief assistant in the Leeds Corporation waterworks department.

**Manchester.**—Mr. Richard Lees has been appointed chief superintendent of telegraphs at the Manchester General Post Office, in the room of Mr. W. E. Halton, who retired lately on pension.

**Newcastle-on-Tyne.**—Mr. A. J. L. Plunket, of the Merthyr Electric Lighting and Traction Company, has joined the staff of the Newcastle-on-Tyne Electric Supply Company.

**Sheffield.** Mr. Reginald G. Tobey, late of Messrs. Johnson and Phillips, Ltd., has been appointed assistant engineer on the electrical staff of Messrs. Vickers, Sons and Maxim's Steel Works, Sheffield.

**Sleaford.**—Mr. W. H. Wilson, of Lincoln, has been appointed chief engineer at Sleaford electricity works.

# Share List of Engineering, Electrical, Iron and Steel, and other Companies.

The following is a comprehensive list of Companies in the industries covered by "Page's Weekly," in which shares business is being currently transacted. Additions will be made from time to time as occasion requires. We desire it to be understood that while our Share List will generally be found correct, we do not hold ourselves responsible for any loss or inconvenience that may arise from possible inaccuracies.

STOCK EXCHANGE SETTLING DAYS.—Settling days on the Stock Exchange are as follows:—

Consols: March 1st. General Settlements: March 9th, 28th; April 17th. Bank Rate, September 28th, 1905, 4 per cent.

## Engineering, Iron, and Steel Companies.

## Engineering, Iron and Steel Companies. Contd.

Present Amount Subscribed	Shares	Last Dividend	Name.	Paid up.	Closing Prices.	Present Amount Subscribed	Shares	Last Dividend	Name	Paid up.	Closing Prices.
11,370	5	5%	Alldays & Onions Pneumatic Engineering, Ltd.	3	2½-3	40,000	1	6%	Drakes, Ltd. 6% Cum. Pref.	1	18/0-19/0
10,000	5	3/-	Do. Cum. Pref. 6 per cent.	5	4½-5½	25,000	50	4½%	Do. 4½% 1st Mort. Deb.	50	41-45
£80,000	Stk	4½%	Do. Mort. Deb. 4½%	100	99-101	200,000	5	in arr.	Dunderland Iron Ore Co., Ltd., 6% Cum. Pref. and Participating	5	3½-3½
65,000	1	5½%	Alley and MacLellan, Ltd.	1	19/6-20/6	4,721	13	13/-	Ebbw Vale Steel, Iron & Coal Co., Ltd.	13	11-12
5,210,000	1	1/-	Armstrong (Sir W. G.), Whitworth and Co., Ltd.	1	3½-3½	69,754	13	10/-	Do. do. do.	13	9-9½
76,970	5	2/-	Do. 4% Cum. Pref.	5	5½-5½	20,250	10	8/-	Elliot's Metal, Ltd.	10	5-5½
1,500,000	100	4%	Do. 4% 1st Mort. Dbs. Rd.	100	101-103	5,000	10	5%	Do. Cum. Pref. 5%	100	8½-9
15,000	10	4½%	Arrol (Sir William) & Co., Ltd.	10	10½-10½	186,748	Stk	4%	Do. Deb. 4%	100	93-95
7,000	10	2½%	4½% Cum. Pref., Nos. 1-15,000	10	10½-10½	500,000	1	6d.	Fairbairn, Lawson Combe Barbour	1	23/0-23/6
			Austin, S. P. & Son, Ltd.	all	9½-10½	30,000	1	5%	Do. 5% Cum. Pref.	1	20/0-21/0
70,000	100	2½%	Do. 5% Cum. Pref.	100	98-101	300,000	100	4%	Do. 4% Mortgage Deb.	100	99-101
£100,000	100	4½%	Do. 4% 1st Mort. Deb.	100	94-97	25,000	10	6/-	Fairfield Shipbuilding & Engng. Co., Ltd., 6% Cum. Pref.	10	11½-12
106,625	5	10%	Aveling and Porter, Ltd., 4½% Reg. Mt. Dbs. Red.	100	10-10½	£250,000	Stk	4½%	Do. 4½% Mort. Deb. Stk. Red.	100	100-102
124,835	5	5%	Avery (W. & T.), Ltd.	5	5½-6	126,000	3	2½%	Fraser & Chalmers, Ltd., Ord.	3	3½-4
109,000	Stk	4%	Do. Cum. Pref. 5%	100	104-105	21,000	3	4½%	Do. 7½% Cum. Pref.	3	5½-6½
£800,000	1	1½%	Do. Deb. 4%	1	4-4½	10,000	10	5%	Galloways, Ltd., 5% Cum. Pref.	10	7½-7½
100,000	1	7½d.	Babcock and Wilcox, Ltd., Ord.	1	1½-1½	£150,000	Stk	4%	Do. 4% 1st Mort. Deb. Red.	100	86-87
20,000	1	5%	Do. 6% Cum. Pref.	1	16/0-17/6	100,000	1	5%	Glover, W. T. & Co., 5% Cum. Pref.	1	14½-14½
20,000	5	3/-	Bagnall John & Son, Ltd.	1	5-5½	£100,000	Stk	4½%	Do. 4½% 1st Mort. Deb.	100	85-90
250,000	1	6½d.	Baker (Joseph) and Sons, Ltd., 6% Cum. Pref.	5	101-103	180,250	10	12/-	Greenwood & Batley, Ltd., Ord.	10	68-68
£250,000	Stk	4½%	Baldwins, Ltd., 5½% Cum. Pref.	100	101-103	110,660	10	7%	Do. 7% Cum. Pref.	100	10½-11½
150,000	4½	3/-	Do. 1st Mt. 4½% Deb. Stk. Red.	100	101-103	13,000	100	5%	Do. 5% Deb.	100	102-103
50,000	4½	3/-	Barrow Hamatite Steel Co., Ltd., O.	4½	37/-39/-	341,000	1	1/-	Guest, Keen & Nettlefolds, Ltd. Ord.	1	2½-2½
166,670	5	5%	Do. do. Cum. 2nd. Pref.	4½	5-5½	£1,850,500	Stk	4%	Do. 5% Cum. Pref.	5	6½-6½
£500,000	100	4½%	Bayliss, Jones and Bayliss, Ltd., 5% Cum. Pref. Shares	5	5-5½	250,000	1	1/-	Do. 4% Irred. Mort. Deb. Stk.	100	106-108
50,000	10	6/-	Beardmore (Wm.) & Co., Ltd., 4½% 1st Mt. Dbs., Red. Scrip 50% pd	—	105-107	20,000	10	4/6	Gwynnes, Ltd., 5% Cum. Pref.	5	2½-3½
£366,600	Stk	4%	Bell Brothers, Ltd., 6% Cum. Pref.	10	124-124	30,000	5	3/-	Hadfield's Steel F'ry Co., Ltd., Ord.	1	35-45
128,320	10	5%	Do. 4% Deb. Stock, Red.	100	100-103	28,001	5	7/-	Do. 4½% Cum. Pref.	10	10½-11
50,000	Stk	4%	Belliss and Morcom, Ltd.	10	11½-11½	£100,000	Stk	6%	Hall (J. & E.), Ltd. 6% Cum. Pref.	5	4½-5½
17,676	10	2½%	Do. Mort. Deb. 4%	100	100-104	45,000	100	4½%	Head, Wrightson & Co., Ltd.	5	5½-5½
1,629,760	1	6d.	Blyth Shipbuilding Co., Ltd.	8	73-8½	140,000	10	10%	Hornsby (Richard) & Sons, Ltd., Ord.	100	100-103
1,860,900	1	3½d.	Boicrow, Vaughan and Co., Ltd., O.	1	22/9-23/3	60,000	10	7%	Hudswell and Clarke and Co., Ltd.	100	85-87
5,340	10	5%	Do. Nos. 1-1,629,760	12½	2-1½	37,500	10	20	Kings' Norton Metal Co., Ltd.	10	17½-18
£308,525	15	22/6	Bow, M'Lachlan & Co., Ltd.	10	93-10	49,537	10	5%	Do. Cum. Pref.	10	114-114½
50,000	1	15/-	Briggs (Henry) Son & Co., L. "A"	15	30-32	15,000	10	5/-	Kynoch, Ltd.	10	17½-18
			Do. do. "B"	15	21-22	10,000	10	15/-	Do. Cum. Pref. 5%	10	102-102
50,000	1	6%	Browett, Lindley & Co.	1	4/0-4/6	150,000	3	8/6	Lanarkshire Steel Ltd., 5% Cum. Pref. Red. Nos. 1-15,000	10	8½-9½
1,160,000	1	4½d.	Do. 6% Cum. Pref.	1	8/8-8/9	120,000	3	7/-	Do. 5% Cum. Pref. 1899 Red. Nos. 25,001-50,000	10	9½-9½
590,000	1	6d.	Brown (John) and Co., Lim., Ord.	15/	1½-1½	120,000	50	5%	Leeds Forge Ltd. Ord.	3	6½-6½
74,000	10	5/-	Do. Ord., Nos. 1,160,001-1,750,000	1	11½-11½	23,465	9	04-05	Do. 7% Pref.	8	14-14½
229,534	5	2/8	Do. 5% Cum. Pref.	10	114-114	200,000	1	7½d	Do. 5% 1st Mortgage Deb.	50	51½-52½
245,045	5	2/6	Cammell, Laird & Co., Ltd., Ord.	5	10-10½	£300,000	Stk	4½%	Land & Glas. Eng. & Iron Ship.	9	84-9
500,000	Stk	4%	Do. 5% Cum. Pref.	5	5½-5½	15,000	10	6/-	Ltd. Nos. 1-23,65	9	18-19
400,000	Stk	4½%	Do. Mort. Deb. 4%	100	99-101	15,000	10	6/-	Lysaght (John), Ltd., 6% Cum. Pf.	100	103-111
629,861	1	—	Do. Mort. Deb. 4½%	100	10½-10½	£150,000	Debs	4½%	Do. 4½% 1st Mt. Deb. Stk., Red	10	7½-8½
130,000	Stk	—	Cargo Fleet Iron Co., Ltd., Ord.	1	23½-24	40,000	10	5-	Do. 6% Cum. Pref. Nos. 1-15,000	10	9½-10½
14,400	10	8/-	Do. 4½% First Mort. Deb.	100	95-97	210,000	1	8½d.	Do. 4½% 1st Mort. Deb. Red.	100	99-102
40,000	5	5%	Carnforth Hematite Iron	10	14-16½	75,000	1	6½d.	Mather & Platt, Ltd., 5% Cum. Pref	10	11½-12½
62,000	1	6%	Chamberlain & Hookham, Ltd.	5	5-5½	£75,000	Stk	4½%	Measures Bros., Ltd., Ord.	1	1½-1½
100,000	100	2½%	Chloride Electrical Storage	1	1½-1½	50,000	1	5½%	Do. 5½% Cum. Pref.	1	14-14½
450,000	1	1/2½	Clarke, Chapman & Co., Ltd.	10	97-100	21,943	5	2/6	Do. 4½% 1st Mt. Db. Stk., Red.	100	99-102
70,000	5	2/8	Do. 5% 1st Mort. Deb.	1	1½-1½	14,248	5	5%	Maldrum Bros. 5½% Cum. Pref.	1	17½-17½
£250,000	Stk	4%	Do. 5% Cum. Pref.	5	5½-5½	100,000	1	6/-	Muntz Metal, Ltd.	6	4½-5½
50,000	1	4%	Do. 4% 1st Mort. Db. Stk. Red	100	99-101	60,000	5	7/-	Do. Pref. 5%	4	4½-5½
50,000	1	5½%	Coghlan Steel & Iron Co., L. Ord.	1	18½-19½	£60,000	Stk	4½%	National Gas Engine 5½% Cum. Pref.	1	23½-23½
100,000	10	50/-	Do. 5½% Cum. Pref.	7½	36-37	14,310	1	2½%	Normanby Ironworks, Ord.	1	9/9-9/6
£7,031	10	10/-	Consett Iron Co., Ltd., Ord.	10	16-17	394,455	1	2½%	Do. 6% Cum. Pref.	1	18½-19½
40,339	10	5%	Crossley, Bros., Ltd., Ord. 40340/97370	10	11½-12	170,270	100	2%	Do. 4½% 1st Mort. Deb.	100	74-77
75,000	1	2/6	Do. 5% Cum. Pref.	10	12-12	250,000	100	2%	Do. 4½% 1st Mt. Db. Stk., Red.	100	86-89
125,000	5	10%	Delta Metal, Ltd. Shares	5	19-21	122,000	5	4%	Palmer's Shipbuilding & Iron Co., Ltd. A...	all	19/0-20/0
125,000	5	5%	Docker Bros. Tea	5	6½-6½	50,000	5	3/-	Do. B...	all	15/8-15/9
1,259,594	1	3½d.	Dorman, Long & Co., Ltd.	1	93-96				Do. 5% Cum. Pref.	all	22/0-22/0
£400,000	Stk	4%	Do. 4% 1st Mort. Perp. Deb. Stk	100	93-96				Do. 4% First Mort. Deb.	all	93-95

Stocks and Shares marked \* are quoted ex-dividend



## Engineering, Iron and Steel Companies.

Present Amount Subscribed	Shares	Last Dividend	Name	Paid up	Closing Prices
70,000	10	10/-	Pease & Partners, Ltd., Ord.	10	13 1/2-14
£100,000	Stk	4/-	Do. 4% Perp. Deb. Stock	100	9 1/2-10 1/2
20,000	5	3/-	Prebost (Brace) & Co., Ltd., 6% Cum. P.	100	4 1/2-5 1/2
65,000	1	1	Pooley (Henry) & Son, Ltd., Ord.	1	12 1/2-13 1/2
13,000	5	2/-	Do. 5 1/2% Cum. Pref.	5	4 1/2-5
126,938	5	2/-	Rhymney Iron Co., Ltd.	5	2 1/2-3 1/2
73,062	5	2/-	Do. New	5	1 1/2-2
£330,000	-	5/-	Do. 5% Mort. Deb., Red.	100	10 1/2-11 1/2
350,000	1	1 1/2	Richardson, Westgarth & Co., Ltd., Ord.	1	1 1/2-1 1/2
£30,000	1	7 1/2	Do. 6% Cum. Pref.	1	1 1/2-1 1/2
£30,000	Stk	4 1/2	Do. 4 1/2% Perp. Deb. Stock	100	10 1/2-11 1/2
7,400	10	7/-	Rivet, Bolt & Nut, Ltd., 5% Cum. Pref., No. 1-27,500	10	10-11
£20,000	10	5/-	Russell, John & Co., Ltd.	10	9-10
100,000	Stk	4 1/2	Do. 4 1/2% Deb. Stock	100	9-10
35,000	10	12/-	Ruston, Proctor & Co., Ltd.	10	11-11 1/2
£250,000	100	4 1/2	Do. Mort. Debts, 4 1/2% till 1908, then 4%	100	14-15
275,000	1	6d.	Scott (Walter) Ltd., Ord.	1	3 1/2-4
300,000	1	7 1/2	Do. 6% Cum. Pref.	1	1 1/2-1 1/2
£300,000	Stk	4 1/2	Do. 4 1/2% Perp. Deb. Stk.	100	9 1/2-10 1/2
549,700	1	1 1/2	Sheepbridge Coal and Iron Co., Ltd., Ord.	1	30-30 1/2
112,275	1	1 1/2	Do. Guar. Pref. 5% Min.	1	31 1/2-32 1/2
137,725	1	2	Do. 112,275, 250,000	1	12 1/2-13 1/2
£111,800	100	5 1/2	Shelton Iron, Steel and Coal Co., Ltd., 1st Charge 5% Debts, Red.	100	9 1/2-10 1/2
£94,400	100	6 1/2	Do. 6% 2nd Mort. Debts, Red.	100	9 1/2-10 1/2
250,000	1	5 1/2	Smith's Dock Co., Ltd., Ord.	1	29 1/2-30 1/2
20,000	10	21/-	Do. 5% Pref.	10	10 1/2-11
200,000	100	2 1/2	Do. 4% Deb. Stk.	100	9 1/2-10 1/2
100,000	1	1	Smith's Thomas, Stamping Wks. Ltd., Deb. 5%	100	1 1/2-2
50,000	Stk	5 1/2	Do. 5% Cum. Pref.	100	15-16
250,000	1	1 1/2	South Durnam Steel & Iron, Ltd., Ord.	1	15-16
300,000	Stk	4 1/2	Do. 4 1/2% Perp. Deb. Stock	100	9 1/2-10 1/2
£300,000	10	5 1/2	Spencer, John and Son, Ltd.	10	14 1/2-15 1/2
20,000	10	2 1/2	Do. 4% Mort. Deb.	100	9 1/2-10 1/2
6,000	100	23	Staveley Coal and Iron Co., Ltd., A	100	15 1/2-16 1/2
3,100	100	10 1/2	Do. B	10	25-26
6,100	60	43	Do. C	10	152-153
3,100	10	10	Do. D	10	25-26
49,560	10	5 1/2	Steel Co. of Scotland, Ltd., Nos. 1-49,560	10	8 1/2-9 1/2
116,240	Stk	5	Do. 5% 1st Mort. Deb. Stk., Red.	100	10 1/2-11 1/2
100,000	Stk	6	Do. 6% 2nd Mort. Deb. Stk., Red.	100	10 1/2-11 1/2
55,000	10	9 1/2	Stewarts & Lloyds, Ltd., Ord.	10	10 1/2-11 1/2
55,000	10	6 1/2	Do. 6% Cum. Pref.	10	14 1/2-15 1/2
350,000	Debs.	3 1/2	Do. 3 1/2% Debts, Red. Nos. 1-3,500	100	9 1/2-10 1/2
694,732	1	6d.	Swan, Hunter & Wigham, Richardson, Lim. Ord.	1	2 1/2-3 1/2
548,845	1	6d.	Do. 5% Cum. Pref.	1	1 1/2-2 1/2
£240,000	Stk	4 1/2	Do. 4 1/2% 1st Mort. Deb. Stk., Red.	100	9 1/2-10 1/2
249,632	1	1	Talbot Continuous Steel Process, Ord.	1	10 1/2-11 1/2
100,000	100	4 1/2	Tannett Walker and Co.	100	6 1/2-7 1/2
300,000	1	6d.	Thames Iron Works, Shipbuilding & Engineering Co., Ltd., 5% Cum. P.	1	1 1/2-2 1/2
£200,000	100	4 1/2	Do. 4 1/2% Irredeem. 1st Mort. Deb.	100	8 1/2-9 1/2
£148,400	1	7 1/2	Thornycroft (John I.) & Co., Ltd., Ord.	1	1 1/2-2 1/2
£160,000	1	7 1/2	Do. 6% Cum. Pref.	1	1 1/2-2 1/2
£80,000	1	4 1/2	Tredegar Iron and Coal "A"	14 1/2	10 1/2-11 1/2
208,000	1	4 1/2	Do. "B"	1	15 1/2-16 1/2
27,000	1	6 1/2	Turnbull (Alex.) & Co., Ltd., Ord.	1	5 1/2-6 1/2
10,000	1	5 1/2	Do. 5% Cum. Pref. Nos. 1-20,000	1	9 1/2-10 1/2
£508,952,500	£100	5 1/2	Tyler (J.) & Sons, Ltd., 5% Cum. P.	10	9-9 1/2
£360,314,100	£100	5 1/2	United States Steel Corp. Com. Stk.	100	42 1/2-43 1/2
£162,268,000	£100	5 1/2	Do. 7% Cum. Pref. Stock	100	10 1/2-11 1/2
3,350,000	1	1 1/2	Do. 10 1/2% 5% Skg. P.d. G. Bds.	1000	102-104
750,000	1	6d.	Vickers, Sons & Maxm. Ltd., Ord.	1	2 1/2-3 1/2
£750,000	Stk	6 1/2	Do. 5% Non-Cum. Pref.	1	1 1/2-2 1/2
£250,000	Stk	6 1/2	Do. 5% Non-Cum. Pref. Stock	100	12 1/2-14 1/2
£1,250,000	Stk	4 1/2	Do. 4 1/2% 1st Mort. Deb. Stk., Red.	100	10 1/2-11 1/2
£1,000,000	100	4 1/2	Do. 4 1/2% 2nd Mort. Debts, Red.	100	10 1/2-11 1/2
40,000	1	20 1/2	Walker, C. & W., Ltd.	1	2 1/2-3 1/2
40,660	5 1/2	5 1/2	Do. Cum. Pref.	5	3 1/2-4 1/2
148,530	1	2 1/2	Wallend, Slipway & Eng. Co., Ltd., Ord.	all	1 1/2-2 1/2
83,550	1	2 1/2	Do. 5% Cum. Pref.	all	19 1/2-20 1/2
225,000	1	1 1/2	Weardale Steel, Coal & Coke, Ltd., Def. Ord.	1	1 1/2-2 1/2
500,000	1	7 1/2	Do. 6% Cum. Pref. Ord.	1	1 1/2-2 1/2
£300,000	Stk	4 1/2	Do. 4 1/2% Perpetual Deb. Stock	100	9 1/2-10 1/2
66,666	5	3	Willans & Robinson, Ord.	5	1 1/2-2 1/2

## Electrical Manufacturing Companies.

Present Amount Subscribed	Shares	Last Dividend	Name	Paid up	Closing Prices
70,000	1	6d.	Alliance Elec. Co., Ltd. 5% Cum. P.	1	2 1/2-3 1/2
125,000	1	7 1/2	Aron Elec. Meter Ltd., 6% Cum. P.	1	5 1/2-6 1/2
120,000	1	1 1/2	Bell's Asbestos Co., Ltd.	1	1 1/2-1 1/2
£10,000	5	9d.	British Aluminium Co., Ltd., 4% Cum. P.	2	5 1/2-6 1/2
£100,000	Stk	5 1/2	Do. 5% 1st Mort. Deb. Stk., Red.	100	9 1/2-10 1/2
100,000	5	4	British Insulated & Helsby Cables, Ltd., Ord.	5	4 1/2-5 1/2
100,000	5	3 1/2	Do. 6% Cum. Pref.	5	5 1/2-6 1/2
£500,000	Stk	4 1/2	Do. 4 1/2% 1st Mort. Deb. Stk., Red.	100	10 1/2-11 1/2
£200,000	Stk	4 1/2	British Thomson-Houston Co., Ltd., 4 1/2% 1st Mort. Deb. Stk., Red.	100	9 1/2-10 1/2
500,000	5	3 1/2	British Westinghouse Electric and Manufac. Co., Ltd., 8% Pref.	5	1 1/2-2 1/2
£1,016,359	Stk	4 1/2	Do. 4% Mort. Deb. Stk., Red.	100	7 1/2-8 1/2
105,731	2	2 1/2	Brush Elec. Engng. Co., Ltd., Ord.	2	1 1/2-2 1/2
150,000	2	6	Do. 6% Pref.	2	1 1/2-2 1/2
£125,000	Stk	4 1/2	Do. 4 1/2% Perp. 1st Deb. Stk.	100	9 1/2-10 1/2
£125,000	Stk	4 1/2	Do. 4 1/2% Perp. 2nd Deb. Stk.	100	8 1/2-9 1/2
35,000	5	5	Callender's Cable & Condn. Ltd., Ord.	5	11-12
40,000	5	2 1/2	Do. 5% Cum. Pref.	5	5 1/2-6 1/2
£33,300	Stk	4 1/2	Do. 4 1/2% 1st Mort. Deb. Stk., Red.	100	9 1/2-10 1/2
85,000	3	1 1/2	Crompton & Co., Ltd.	3	2-2 1/2
£100,000	-	5 1/2	Do. 5% 1st Mort. Reg. Debts	100	10 1/2-11 1/2
52,000	5	10	Dick, Kerr & Co., Ltd., Ord.	5	8 1/2-9 1/2
61,000	5	8	Do. 6% Cum. Pref.	5	6-6 1/2
£33,334	Stk	4 1/2	Do. 4 1/2% Deb. Stock, Red.	100	10 1/2-11 1/2
233,334	1	6d.	Doulton & Co., Ltd., 5% Cum. Pref.	1	1 1/2-2 1/2
99,261	5	1 1/2	Do. 1st Mort. 4% Free Deb. Stk.	100	10 1/2-11 1/2
17,139	5	2 1/2	Edison and Swan United Electric Light, Ltd., "A" Shares	3	14-15
£327,356	Stk	4 1/2	Nos. 1-99,261	3	14-15
£72,720	Stk	5 1/2	Do. "A" Shares Nos. 01-017,139	5	24-25
112,100	2	1 1/2	Do. 4% Deb. Stock, Red.	100	8 1/2-9 1/2
31,390	2	2 1/2	Do. 5% Second Deb. Stk., Red.	100	9 1/2-10 1/2
£200,000	Stk	4 1/2	Electric Construction Co., Ltd.	2	2-2 1/2
10,248	10	7 1/2	Do. 7% Cumulative Pref.	2	2-2 1/2
25,000	10	5 1/2	Do. 4% Perp. 1st Mt. Deb. Stk.	100	9 1/2-10 1/2
£200,000	Stk	4 1/2	Evered and Co., Ltd.	10	3-11
35,000	5	5	Gen. Elect. Co. (1900), Ltd., 5% Cum. Pref.	10	9 1/2-10 1/2
50,000	10	2 1/2	Do. 4 1/2% 1st Mt. Deb. Stk., Red.	100	9 1/2-10 1/2
£300,000	100	4 1/2	Henley's (W. T.) Telegraph Works Co., Ltd., Ord.	5	13-14
100,000	1	3 1/2	Do. 4 1/2% Cum. Pref.	5	5 1/2-6 1/2
87,350	12	12 1/2	India Rubber, Gutta Percha & Telegraph Works Co., Ltd., 1st Mort. Deb. Red.	100	18-19
150,000	100	4 1/2	Do. 1st Mort. Deb. Red.	100	99-102
150,000	1	1 1/2	Scott (Ernest) & Mountain, Ltd., Ord.	1	17 1/2-17 3/4
£50,000	Stk	5 1/2	Telegraph Construction and Maintenance Co., Ltd.	12	34 1/2-36 1/2
150,000	100	4 1/2	Do. 4% Deb. Bonds	100	100-102
150,000	1	1 1/2	United Electric Car Ord.	1	24 1/2-25 1/2
£50,000	Stk	5 1/2	Do. 5% 1st Mort. Deb. Red.	100	10 1/2-11 1/2

## Railway Carriage and Wagon Companies.

Present Amount Subscribed	Shares	Last Dividend	Name	Paid up	Closing Prices
10,000	10	7 1/2	Birm. Rail.-Car. & Wagon, L., 1-10,000	10	25 1/2-27
8,739	10	3 1/2	Do. Second Issue 1-8,739	4	10-10 1/2
10,000	10	6	Do. Cum. Pref. 6% 1-10,000	10	13 1/2-14 1/2
197,224	Stk	4 1/2	Do. Deb. P.	100	102-104
50,000	10	10	Bristol and South Wales Railway Wagon, Nos. 1-50,000	3	5 1/2-6 1/2
5,000	10	8	Do. Nos. 1-5,000	10	18 1/2-19 1/2
2,000	20	8	Do. 1-75, Nos. 8,001-13,000	2	3-4 1/2
30,111	7	7 1/2	Do. 5 p.c. Participating Pref. Nos. at £2000	10	18 1/2-19 1/2
44,889	7	3 1/2	Gloucester Rail.-Car. & Wagon, Ltd., A, 1-29,861 & 49,751-50,000	7	10 1/2-11 1/2
10,000	10	6 1/2	Do. B, 29,862-49,750, 50,001-75,000	7	44-45
14,567	10	1 1/3	Lancashire and Yorkshire Wagon, Ltd.	10	12 1/2-13 1/2
4,150	10	5 1/2	Do. do.	2	28-29
784,808	1	9d.	Metropolitan Amalgamated Rail.-Carriage & Wagon, Ltd., 1-784,808	1	10 1/2-11 1/2
164,288	1	6d.	Do. Cum. A Pref. 5% 1-164,288	1	21 1/2-22 1/2
235,000	1	7 1/2	Do. Cum. B Pref. 6% 1-235,000	1	27 1/2-28 1/2
20,000	20	20/-	Midland Rail.-Car. & Wagon, Ltd., 1-20,000	10	21-22
10,000	6	10	Western Wagon and Property Nos. 1-10,000	10	12 1/2-13 1/2
40,000	6	10	Do. Nos. 10,001-40,000	2	4 1/2-5 1/2

Stocks and Shares marked \* are quoted ex dividend.

# Weekly Synopsis of Company Meetings and News.

**Wallsend Slipway and Engineering Company.** The annual general meeting of the shareholders of the Wallsend Slipway and Engineering Company, Ltd., was held at the company's office, Queen Street, Newcastle-on-Tyne, on Tuesday, Mr. Thomas Bell, J.P., chairman, presiding, when it was decided that a dividend of 2½ per cent. (less tax) be paid on the preference shares, making 5 per cent. for the year; that a dividend of 3½ per cent. (less tax) be paid on the ordinary shares, making 6 per cent. for the year; that there be written off for depreciation the sum of £16,000; that there be added to the reserve fund the sum of £6,000; that there be added to the special fund for jetties, works improvements, etc., the sum of £10,000; and that there be carried forward the sum of £8,238s. 8d. The retiring director, Mr. Andrew Laing, was re-elected.

**Measures Brothers, Ltd.**—The annual meeting was held on February 15th, at Winchester House, Old Broad Street, E.C. Mr. Robert H. Measures occupied the chair, and, in referring to the unsatisfactory character of the report, said that if the improvement which had now set in continued, he did not think shareholders would go without a dividend next year. They had a valuable asset in the Croydon business, and it was possible that the Croydon works might become the company's main factory. They could not expect always to retain their premises in London, owing to the heavy burden of rates and taxes. After some discussion the report was adopted.

**W. T. Henley's Telegraph Works.**—A dividend on the ordinary shares of 15 per cent., less income tax, including the interim dividend of 5 per cent. paid September 1st, is recommended. The same amount was paid in 1923.

**National Gas Engine Company.**—The annual meeting of this company was held at Ashtamunder-Lyne on February 12th. The accounts showed a net profit of £4,014. A final dividend of 7½ per cent. was declared on the ordinary shares, making 15 per cent. for the past year, and £10,400 placed to the reserve fund, leaving £14,414 to be carried forward. Mr. Dugald Clerk was elected a director. The company's reserve now stands at £41,000.

**Brown Bayleys Steel Works.** The directors have decided to recommend the payment of a final dividend of 10 per cent., making with the interim dividend 15 per cent. for the year. It is proposed to add £20,000 to reserve and to carry forward £12,083.

**Wilsons and Mathiesons, Ltd.** The report states that the net profits for the past year were £12,432 and £3,442 was brought forward. Dividend interest requires £1,473 and £1,000 has been added to the reserve fund. A dividend of 7½ per cent., free of income tax, is recommended on the ordinary shares, carrying forward £3,116.

## Uskside Engineering and Rivet Company, Ltd.

The directors in their report for the year 1923 expressed their belief that the trade depression showed some signs of passing away. Their forecast says their report for the 12 months ended December 1923 has been to some extent fulfilled, though the state of trade still leaves much room for improvement. The directors have sanctioned further expenditure on plant and machinery in both the engineering and rivet departments, which they believe will result in working with greater economy. The report recommends that the preference interest to the 31st December 1923 be paid as usual, and that a dividend of 10 per cent., free of income tax, be paid on the ordinary shares.

## Share List Continued.

### Locomotive Builders.

Present Amount Subscribed	Shares.	Last Dividend	Name	Paid up	Closing Prices
200,000	1	1/-	Beyer, Peacock and Co., Ltd., Ord.	1	1-7½
300,000	1	6½d.	Do. 5½% Cum Pref.	1	4-8
£300,000	Stk	4½%	Do. 4½% Red. Deb. Stock	100	88-90
47,500	10	7½%	Hawthorn, Leslie & Co., Ltd. Ord.	10	97-99
60,000	100	5%	Manning, Wardle & Co., Ltd.		
			5½% 1st Mortgage Deb	100	100-101
100,000	10	16/-	North British Locomotive Ord. ..	10	174-175
75,000	10	5/-	Do. 5% Cum. Pref. ..	10	123-125
25,000	10	—	Stephenson (Robert) & Co., Ltd., Or.	10	2-25
25,000	10	5/6	Do. 5½% Cum. Pref. ..	10	54-55
£250,000	Stk	4%	Do. 4% Perp. Deb. Stock	100	83-86
180,000	1	2/-	Vulcan Foundry .. .. .	1	26/0-26/6



### Birmingham Railway Carriage and Wagon.

The annual meeting of this company was held at the Grand Hotel, Birmingham, on the 10th inst., under the presidency of Mr. Thos. Pickard. The report and accounts were adopted and the interim dividends confirmed. It was also resolved that the 6 per cent. preference dividend to December 31st, 1905 (less tax) be paid forthwith and that a dividend at the rate of 2 per cent. per annum for the half year (free of tax) on the ordinary shares, making with the interim dividend of  $7\frac{1}{2}$  per cent. per annum a dividend of 10 per cent., and a bonus of 3 per cent. for the year.

**North Central Wagon Company.**—The nineteenth half-yearly meeting of the North Central Wagon Company Ltd., was held at Rotherham on February 16th, Mr. P. B. Coward presiding. The report and balance-sheet were received and adopted, the dividend being at the rate of 10 per cent. per annum, together with a bonus of 3 per cent.

**Lancashire Wagon.**—The half-yearly meeting of shareholders in the Lancashire Wagon Company was held at Bury on February 14th, Mr. Alfred Smithurst presiding. The report showed a profit of £8,420 and a sum of £8,556 available for dividend. In moving its adoption the chairman referred to the rapid strides which had been made by the company. He pointed out that their business was three times greater than it was twelve years ago, and that whereas twelve years ago their stock of wagons was valued at about £80,000, its present value was £266,792. The directors recommend a dividend of 14 per cent. on the ordinary shares, and a bonus which makes the dividend equal to 15 per cent. per annum. The report was unanimously adopted.

### Gloucester Railway Carriage and Wagon.

—The directors have declared an interim dividend for the half-year ended December 31st last at 3 per cent. per annum, free of income tax.

**James Dunlop and Co.**—The directors' report for the year ended December 31st states that the gross profit for the year is £37,710, from which falls to be deducted general expenses, legal charges, etc., amounting to £3,639, leaving net profit for the year £34,077. There is, adding the balance brought forward, £114, a total of £34,192. Out of this has been paid one half-year's dividend on preference shares at 6 per cent., £9,000, leaving an available balance for disposition of £25,192. Thus the directors propose to appropriate as follows: Provision for depreciation, £18,000; half-year's preference dividend at 6 per cent. to December 31st, 1905, £4,500; dividend on

ordinary shares at the rate of 7 per cent. per annum, £7,437, leaving a balance to be brought forward to next account, £754. The directors state that revenue account has been charged with the expenditure necessary to maintain the works and collieries in a state of efficiency.

**Henry Pooley and Son, Ltd.** The report of the directors states that the profit for the year ended December 31st last after providing £1,293 12s. 6d. reserve for doubtful debts, £2,184 11s. 6d. reserve for depreciation, and writing off £1,000, the balance of preliminary expenses, and also part cost of works removal at Glasgow and Birmingham, amounts to £6,008 4s. 4d., and adding the amount brought forward from last account £3,296 10s. 7d., the total is £9,304 15s. 11d. The disposable surplus is £9,872 17s. 6d., which the director recommend shall be dealt with as follows: To pay one-and-a-half year's dividend on the  $3\frac{1}{2}$  per cent. preference shares, being the whole of the dividend due to April 1st, 1905, less income tax, £5,000 7s. 6d., and carrying forward £4,778 9s. 7d.

### Swan, Hunter and Wigham Richardson Ltd.

—The directors' report states that after providing for depreciation on buildings, plant, and machinery, etc., there remains a net profit on the year's trading of £93,354 8s. 11d., to which has to be added the balance brought forward from the previous year, £15,350 7s. 6d. The directors recommend a dividend at 5 per cent. per annum on £634,732 ordinary shares for the year ended 31st December, 1905, and after writing off £4,000 for preliminary and formation expenses, there is a balance to be carried forward of £5,031 11s. 4d. The shipyard and engine works of the company continue to maintain their position, in the first rank, both as regards output and variety of types produced. The large high speed passenger steamship now being built for the United Steamship Company, Ltd., will be launched during the latter part of the year. The works are moderately well employed at the present time at better rates than the low prices of last year, and though the costs of production are also higher, the directors consider the prospects for the year 1906 better than during the last year.

## New Companies Registered.

In the following list the registered addresses of New Companies are given whenever possible. As, however, this information may be legally withheld until the actual date of commencing business, addresses are not always obtainable.

**Channing Brothers, Ltd.**—Capital, £500,000. 100,000 shares (1 per cent. preference). Object, to carry on in the United Kingdom or elsewhere the business of making, making and repairing, and selling iron and tin plate works, stampers and rollers, box and cask makers, general metal workers, engineers, etc., to acquire the business carried on at 24, Weston Street, Bow Common, E. by Channing Brothers, and to adopt an agreement with C. P. Channing and J. Channing. No initial public issue. Registered at 24, Weston Street, St. Leonards, East Kent.

**Riley y Cia, Ltd.**—This company was just then registered with a capital of £20,000 in 40 shares of £500 preference to carry on the business of electrical engineers and manufacturers, constructors, repairers, maintainers, and runners of installations, wires, cables, and other works for the supply and distribution of electricity for light, heat, and motive power, and for the working of railways, tramways, etc. No initial public issue. Director's qualification, 100 shares. Remuneration, 10 per cent. of the net profits remaining after 6 per cent dividend has been paid on the preference and 10 per cent. on the ordinary shares divisible. Registered by C. M. Evans. 14 Bute Street, Cardiff.

**Dynamic Syndicate, Ltd.**—Capital £12,500 in 125 5 per cent. cumulative preference shares of £10 each and 6,000 ordinary shares of 1s. each. Object, to acquire any patents and inventions relating to the production, treatment, storage, application, distribution and use of electricity, and to carry on the business of suppliers of electric light and power, electricians, mechanical engineers, garage keepers, manufacturers of electric cars and vehicles, etc. No initial public issue. Registered office: 6, Broad Street Place, E.C.

**William and Thomas Robson, Ltd.**—Capital £15,000 in 220 "A" preference and 240 "B" preference shares of £25 each and 1,000 ordinary shares of £1 each. Object, to acquire the business carried on at 60 Farringdon Road and 13 Warner Street, Clerkenwell, E.C., and at 18 Park Street, Southwark, S.E., as William and Thomas Robson and to carry on the business of wheelwrights, joiners, carpenters, mechanical and motor engineers, founders, metal workers, carriage and motor vehicle builders, etc. Registered office: 60, Farringdon Road, E.C.

**P. and C. Garnett (France), Ltd.**—Capital £25,000 in 50 shares. Object to carry on at Rotherham the business of rollers, drawers, and manufacturers of iron, steel, copper and other wire, machine makers, founders, engineers, tool makers, brassfounders, etc. No initial public issue. Registered office: Works, Cleckheaton, Yorkshire.

**David Bruce and Co., Ltd.**—Capital £10,000 in 20 shares (1,000 preference). Object to acquire the business carried on by D. R. Bruce at 131, H.G. Helborn, W.C., as David Bruce and Co., and to carry on the business of inventors, model makers, engineers, founders, etc. No initial public issue. Registered office: 131, H.G. Helborn, W.C.

## Company Liens Registered.

**Rhymney Iron Company, Ltd., London, E.C.**—Trust deed, registered February 10th, for £200,000 five per cent. first mortgage New Pitts debenture stock; trustees: Sir W. T. Lewis and Sir H. W. Tyler; secured by a first mortgage on mineral rights covering an area of about 2,500 acres, with plant and machinery.

**Walter Spencer and Co., Ltd., Sheffield.**—Then registered February 10th for £750 five per cent. debentures, part of £4,000; amount previously issued, £125; no trustees; charged on the undertaking and all the property and assets, including the uncalled capital but subject to a specific mortgage.

## The Cost of Warships.

In his fourth Cantor lecture on "Modern Warships," Sir William White dealt with typical British battleships from the *Royal Sovereign* class to the *Lion* class, and the contemporaneous battleships in certain foreign navies. He showed that in British battleships the displacement in the period of twelve years had increased from 14,000 tons to about 16,400; that the cost, exclusive of armaments, had increased from about £800,000 to about 1½ millions, made up, in the *King Edward* class, as follows: Cost of hull, rather more than £400,000; armour, £400,000; and labour, about £250,000; propelling and auxiliary machinery, about £200,000; gun mountings, mechanisms, and torpedo tubes, about the same as the propelling machinery; and the incidental charges of the dockyard ships, about £90,000. The guns cost nearly £100,000. The cost of the *Dreadnought* completed thirty years ago was £600,000; the estimated cost of the *Ironclad* now being completed was about 1½ millions. This great increase in size and cost of battleships was not confined to the Royal Navy. The French *Patrice*, of 14,500 tons displacement, was estimated to cost £1,420,000, and the *Hess* class in the German Navy cost £1,137,000, their displacement being only 14,000 tons.

The First Lord of the Admiralty and the Secretary of War have agreed to receive a Latham deputation who wish to suggest means of preventing the malingering by Government contractors of the "four wages resolution" of the House of Commons.

It is reported that the Australian Federal Cabinet will send its Naval Director, Captain Crosswell, to England in a fortnight to study the Admiralty developments of torpedo construction, consult contractors, and procure generally for the benefit of the port of Melbourne.



# Prices Current of Coal, Iron, Steel, and Other Metals.

## Manufacturers' and Merchants' Quotations.

### News of the Week in Brief.

Wednesday, February 21st, 1906.

**THE speculative Iron Markets**, both in London and Glasgow, have been more or less demoralised, and a fall in quotations has to be recorded. Cleveland was noted down to 47s. 2d. cash in Glasgow, but the London price was slightly better than this. The fall naturally frightened speculative holders and there was a rush to sell. The closing price is 49s. 10d. one month, Cleveland, with hematite at 64s.

The **Standard Market**, says Messrs. Henry Bath and Son has been deteriorating, one declining at first from 47s. 10s. cash and 47s. 15s. forward to 47s. and 47s. 10s. rapid improvement then took values to 47s. 10s. cash and 47s. forward, but from this point there was a relapse to 47s. 10s. and 47s. 15s. Yesterday the market was buoyed up by the favourable statistics and closed 47s. cash and 47s. 15s. three months. The sharp decline in values that was experienced at the beginning of the fortnight was due to the concessions in the prices for refined copper; this was taken advantage of by bears and the chief supporters of the market seemed inclined to let prices find their own level, although leading interests continued to purchase forward delivery iron, but to do so without lowering the market.

In **Tin**, leading operators were active buyers at one period. Up to £167 7s. 6d. per ton was paid for cash, while three months rose to £165 15s., but at the higher level a fair amount of realisations of previous purchases took place, and the best prices could not be maintained, especially when towards the end of the week it was reported that the shipments from the Straits for the first half of this month would amount to 2,000 tons. Some bear selling also was noticeable. **Lead**, after a fall, has steadied a little.

**Spelter** has again suffered quite a sensational fall owing to continued realisations by disappointed speculators and some bear selling. Little desire was shown by dealers, says Merton and Co.'s circular to take up these lots, and it was only when 42s. 6s. was reached that some business could be done. This level proved to be more attractive and when the selling pressure was relaxed a slight improvement took place. Consumers have naturally been frightened by the rapid break in prices and only a few orders are given out. The lower prices are creating more interest for zinc sheets.

### Iron, Steel, Pig-Iron, etc.

#### SCOTLAND.

**Messrs. David Colville and Sons, Ltd., Dalzell Steel and Iron Works, Motherwell, N.B.**, quote as follows: (By cable and telegraph.)

STEEL		£	s.	d.
COILS	Sections, Steel Plates, Medium Boiler Quality	8	2	0
	Boiler Quality	8	0	0
STEEL	Steel Plates, Boiler Quality	8	0	0
COILS	Sections, Steel Plates, Special Quality Plates	8	0	0
STEEL	Boiler Quality	8	0	0

#### Manufactured Iron:

Bars—(6 in.)	£	s.	d.
Best	7	2	0
Best House	7	0	0
Best Angle	7	0	0
Best Cast	7	0	0
Best Best	7	0	0

Usual terms and extras. Special rates for delivery in England and export. The above prices subject to variation without notice.

#### Malleable Common Bars:

	£	s.	d.
Dalzell, Motherwell	7	2	0
Govan	6	10	0
North British	6	10	0
Dumfries	6	7	0
Waverley	6	10	0
Crown	6	5	0
Dumfries	6	5	0
Munk	6	5	0
Rochester	6	5	0
Phoenix	7	5	0
Coatbridge	7	2	0
Coats	6	5	0
Angle Iron	6	5	0
Steel Plates, ship	6	5	0
Boiler Plates	6	5	0
Rolls	6	5	0
Rolls—Crown	6	5	0

By cable and telegraph. No. 148, No. 3, 018.

**John Spencer (Coatbridge), Ltd., Phoenix Ironworks, Coatbridge, N.B.**, quote:

Bars—Phoenix	£	s.	d.
Best	7	2	0
Best Best	8	0	0
Extra Best	8	1	0
Best House Steel	7	1	0
Extra B.H.S.	8	1	0
Extra Best Cable	8	0	0
Rivet	7	4	0
Best Ship Rivet	8	0	0
Angles—Phoenix	£	s.	d.
Best	7	5	0
Extra Best	8	0	0
Gas Tube Hoops—Phoenix Best	£	s.	d.
Plates—Phoenix	8	10	0
Best Boiler	9	0	0
Best Best Boiler	10	0	0
Extra Best Boiler	10	0	0
Boiler Tube Strips—Phoenix	£	s.	d.

All porters delivered to Glasgow, Greenock, Grangemouth, Gairloch, Leth. or Ardrosson, 5 per cent. discount monthly.

Singles 100 to 108 by 30 in. per ton.	Boulders, 21 to 36, to 48 by 30 in. per ton.
£ s. d.	£ s. d.
20 0 0	21 10 0
20 0 0	22 10 0
24 0 0	25 0 0

Per Box  
10 lb.  
Wales,  
£ s. d.  
0 11 0  
0 10 0  
0 11 3  
1 6 0

0 14 0









# Cleveland Foundry Iron.

**Messrs Alfred Dobell and Co, Liverpool** quote to  
 vend 1000 tons of 14-Liverpool terms.

COLONIAL WOODS.

*Phyllanthus*

[illegible]

## Deals.

1st quality Quebec Pine ..	per std.	22	10	at	10	at
17	0	0	0	0	0	0
11	10	0	1	0	0	0
7	15	0	8	0	0	0
7	14	0	7	1	0	0

Spruce Boards

$$15 \quad 1 \quad 0 \quad \frac{1}{2} \quad 0 \quad 0$$

UNITED STATES, ETC., WOODS.

## Pitch P : 100.

How	percentage	0	1	6	10	2	0
Stacy		0	1	6	0	1	10
Philip	Stacy	0	1	6	0	1	2
Boris	Philip	per	std.	10	0	18	10

## Oak Timber

per cub. ft. 0.1 to 0.2

### Oak Planks

$$, \quad 0 \quad 1 \quad 0 \quad 0 \quad 2 \quad 1$$

## East India Teak

per. level 1.  $\alpha = 0.05$  (two-tailed)

## Greenhouse:

$$0 \leq 1 - \theta \leq 1 \quad \text{and} \quad 0 \leq \theta \leq 1$$

**EUROPEAN WOODS.**

Timber.

Design	per cent of	$\sigma$	$\tau$	$\sigma/\tau$	$\sigma/\tau$
Design 1: 1 Metal Fin, Crown	0	2	1	2	46
Design 2: 2 Metal Fin, Modelling	0	2	0	1	11
Steel	0	2	0	1	11
Steel	0	1	0	0	1
Resin White	0	1	0	1	1
Non-A-Ming Fin, etc.	0	0	0	0	0
Design 3: Steel, etc., O.L.	0	0	0	0	0

Norway Spar-

(1) 1. (2) 1. 3.

## Deals.

1	10	10	10	10	10	10	10
2	10	10	10	10	10	10	10
3	10	10	10	10	10	10	10
4	10	10	10	10	10	10	10
5	10	10	10	10	10	10	10
6	10	10	10	10	10	10	10
7	10	10	10	10	10	10	10
8	10	10	10	10	10	10	10
9	10	10	10	10	10	10	10
10	10	10	10	10	10	10	10
11	10	10	10	10	10	10	10
12	10	10	10	10	10	10	10
13	10	10	10	10	10	10	10
14	10	10	10	10	10	10	10
15	10	10	10	10	10	10	10
16	10	10	10	10	10	10	10
17	10	10	10	10	10	10	10
18	10	10	10	10	10	10	10
19	10	10	10	10	10	10	10
20	10	10	10	10	10	10	10
21	10	10	10	10	10	10	10
22	10	10	10	10	10	10	10
23	10	10	10	10	10	10	10
24	10	10	10	10	10	10	10
25	10	10	10	10	10	10	10
26	10	10	10	10	10	10	10
27	10	10	10	10	10	10	10
28	10	10	10	10	10	10	10
29	10	10	10	10	10	10	10
30	10	10	10	10	10	10	10
31	10	10	10	10	10	10	10
32	10	10	10	10	10	10	10
33	10	10	10	10	10	10	10
34	10	10	10	10	10	10	10
35	10	10	10	10	10	10	10
36	10	10	10	10	10	10	10
37	10	10	10	10	10	10	10
38	10	10	10	10	10	10	10
39	10	10	10	10	10	10	10
40	10	10	10	10	10	10	10
41	10	10	10	10	10	10	10
42	10	10	10	10	10	10	10
43	10	10	10	10	10	10	10
44	10	10	10	10	10	10	10
45	10	10	10	10	10	10	10
46	10	10	10	10	10	10	10
47	10	10	10	10	10	10	10
48	10	10	10	10	10	10	10
49	10	10	10	10	10	10	10
50	10	10	10	10	10	10	10
51	10	10	10	10	10	10	10
52	10	10	10	10	10	10	10
53	10	10	10	10	10	10	10
54	10	10	10	10	10	10	10
55	10	10	10	10	10	10	10
56	10	10	10	10	10	10	10
57	10	10	10	10	10	10	10

**Open-Hearth Steel Output.**—The following figures

with the production of Siemens steel in the United Kingdom for the past year. The total output of ingots was 1,879,000 tons, an increase on the previous year of 100,000 tons. In Cleveland and Durham it appears that open hearth furnaces were in operation out of a total of about 125. The average output per furnace increased, three of the works averaging 20,000 tons of ingots per furnace for the year. Out of the ingots obtained there were no less than 1,750,000 tons of steel. The examples in point of efficient producing districts

A NEW YORK CITY TRADING HOUSE, THE BOSTON AND  
reaction in Cleveland foundry iron, the value of which  
has steadily been supported about the best price  
for a long time. The market is expected to be  
further stimulated by the new iron, the current  
demand of which has been steadily increasing.  
The iron market has been the beginning of the  
year, and the business which was created in iron  
regarding American sales of iron to Europe, especially  
various countries, but also to an enormous  
amount of production by domestic holders. Apart  
from temporary spasmodic rallies, the pressure to sell  
has pointed out has not as yet relaxed to any great  
extent, although the rumours mentioned have no  
foundation whatever. Prices which European con-  
sumers could afford to pay for American iron are indeed  
far too low as compared with those ruling on the other  
side. It is obvious that a big bull account was built  
up towards the end of last year, partly in anticipation  
of American purchases, and the rather less favour-  
able accounts about the general condition of trade  
during the last few weeks have helped in shaking  
confidence. While the weak element has now been  
largely eliminated in the warrant market on the big  
drop, there is reason for believing that a turn for the  
better is now due, for the reduction of the heavy  
commitments for the rise has been accompanied by  
short selling to an extent which is bound to benefit  
the market on any decided recovery. The clearances  
from Middlesbrough since the beginning of the year  
make meanwhile a good showing.

## Modern Colliery Equipment.

Professor F. W. Hardwick, of Sheffield University, delivered a lecture at the Assembly Room, Market Hall, on "Sinking on Saturday Last on 'Sinking and Equipping a Modern Colliery.'" The lecturer dealt with various methods of sinking under ordinary conditions and under special difficulties, temporary and permanent lining of shafts, brickwork, tubular, sinking scaffolds, winding of material, ventilation, and methods of extracting water. The lecture was illustrated by lantern slides and specially prepared photographs and diagrams. Centrifugal pumps worked by electricity have recently been used in sinking, and appear to give good results. The lecturer emphasised the importance of giving earliest attention to the special sinking rules of the district in which the shaft is being sunk.

# Prices of Coal and Iron.

THE results of the Board of Trade returns, just issued of the selling price of coal and iron, are given in the table below:

Product and District.	Price according to last Audit.		Increase (+) or Decrease (-) of last Audit as compared with	
	Period covered by last Audit.	Ascertained average selling price per ton.	Previous Audit.	A Year ago.
<b>Coal.</b>	1905	s. d.	s. d.	s. d.
Northumberland:— (Average of all classes of coal at pit's mouth)	Sept.-Nov.	6 2'15	+ 0 0'86	- 0 0'54
<b>Pig Iron.</b>				
Cleveland ... ..	Oct.-Dec.	47 5'82	+ 1 5'82	+ 4 1'23
Cumberland ... ..	Oct.-Dec.	69 10'7	+ 12 4'33	+ 15 3'73
West of Scotland...	Nov., 1905— Jan., 1906	58 1	- 0 8	
<b>Manufactured Iron.</b>				
North of England:— (Rails, plates, bars, and angles)	Nov.-Dec.	123 6'53	+ 3 6'19	+ 7 1'64
West of Scotland:— (Rounds, squares, flats, angles, tees, hoops, and rods)	Nov.-Dec.	119 11'42	+ 2 3'64	+ 5 1'55

## Coal.

THE average price of Northumberland coal for the three months, September—November, 1905, was 6s. 2'15, which showed little change as compared with the previous audit, and with that for a year ago. In connection with this ascertainment it was decided at a meeting of the Northumberland Conciliation Board on January 6th, to advance the wages of underground workers and banksmen by 1½ per cent., and of other surface workers by 1 per cent., on standard rates.

## Pig Iron.

THE net average invoice price of No. 3 Cleveland pig iron for the three months, October—December, 1905, was 47s. 5'82d. per ton. This shows an advance on the price of the previous three months of 1s. 5'4d., and on the price of the three months, October—December, 1904, of 4s. 1½d. The price of Cumberland pig iron in the same period of 1905 was 69s. 10'7d., being 12s. 4½d. higher than in the previous quarter, and 15s. 8½d. higher than a year ago. The average selling price for cash in the Glasgow market of Scottish pig iron warrants for the three months, November, 1905—January, 1906, was 58s. 1d., which was 3d. lower than in the previous quarter. As a result of

these ascertainments, the wages of blast-furnace men in the Cleveland district were advanced 1½ per cent. on the standard, and those of blast-furnace men in West Cumberland 18 per cent. on the standard. The wages of blast-furnace men in the West of Scotland remained unaltered.

## Manufactured Iron.

IN the North of England the ascertained selling price of specified classes of manufactured iron in November and December was 123s. 6'53d., which was 3s. 6½d. higher than for the previous audit and 7s. 1½d. higher than a year ago. In Scotland for the same period of 1905 the price was 119s. 11'42d., or 2s. 3½d. higher than the previous audit, and 6s. 1½d. higher than that of a year ago. As a result of these ascertainments the wages of puddlers and millmen in the North of England were advanced by 3d. per ton and 2½ per cent. respectively; while in Scotland they remained unchanged. The Mid-

land Iron and Steel Wages Board also decided to grant advances similar to those of the North of England.

## Correspondence.

### Messrs. Yarrow and Co.'s Removal.

To the Editor of PAGE'S WEEKLY.

SIR:—We are favoured with your letter of the 13th, together with enclosed paragraph.\*

We think this paragraph does not at all indicate the facts. We have quite made up our minds to leave for the north. We are by no means as busy as we were in former years, which, no doubt, in a great measure, is due to the high cost of production in London as compared with localities where materials are at hand, and labour is cheaper. Our premises cannot be described as "vast works" and the value is nothing like "a million sterling."

At the present time we have in hand two destroyers for the British Government, two destroyers for the Greek Government, twenty-four Yarrow boilers for the British Navy for H.M.S. *Shannon*, and about eight shallow draught steamers for South America and India, having draughts varying with steam up from 12 to 15 m.

We are, yours faithfully,

For Yarrow and Co. Ltd.,

A. L. Y.

\*From the daily press submitted for verification.—ED.



# Metal Trade Statistics—Copper.

Compiled by Messrs. Henry R. Merton and Company, Limited.

## STOCKS IN ENGLAND AND FRANCE:—

STANDARD COPPER	Liverpool and Swansea, Crude Bars and Ingots ...	...
	English Standard Copper...	...
	other Standard Copper ...	...
	London (including landing) Newcastle on Tyne, and Birmingham	...

15th Feb.	31st Jan.	15th Jan.	31st January.		
1906.	1906.	1906.	1905	1904.	1903.
Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
680	740	750	1,120	1,175	1,300
1,900	2,150	2,025	2,000	1,799	1,476
—	—	123	898	—	383
419	417	400	2,087	405	1,055
2,999	3,307	3,698	8,505	3,429	7,314
512	778	308	889	891	861
1,674	1,591	1,334	2,664	1,553	1,181
5,185	5,676	5,240	11,858	5,883	9,350
2,050	2,475	2,700	2,675	4,225	2,275
3,000	2,800	3,250	1,200	4,025	2,500
10,235	10,951	11,190	15,733	14,233	15,131

Liverpool and Swansea, Furnace Material (fine) ...  
 Standard Fine Copper in Haves, Rods, Rods & Dunker ...

## AFLOAT FROM CHILI, Fine Copper AUSTRALIA.

Price of G.M.B.'s and Standard Copper, per ton ... £77 15 £78 10 £79 10 £68 0 £56 7/6 £54 15

## COMPARATIVE STATEMENT.

Fortnight ending 15th Feb., 1906	Tons.	Price of G.M.B. Standard Copper	SUPPLIES			SHIPMENTS FROM CHILI TO EUROPE AND U.S.		SHIPMENTS FROM AUSTRALIA TO EUROPE		TOTAL SUPPLIES	
			LONDON, LIVERPOOL, AND AFRICA THROUGH FROM CHILI AND AUSTRALIA	ALL OTHER EUROPEAN COUNTRIES	TOTAL OF TWO PRECEDING COLUMNS.	ENGLAND AND FRANCE FROM SPAIN, PORTUGAL AND OTHER COUNTRIES.	Tons.	Tons.	Tons.	Tons.	Tons.
Fortnight ending 15th Feb., 1906	10,235	£77 15	2,408	4,412	6,750	1,477	2,667	750	600	12,244	12,960
Month ending	Tons.		Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
31st Jan. ...1906	10,951	£78 10	4,243	12,571	16,814	1,837	1,931	1,850	1,900	24,332	26,264
31st Dec. ...1905	12,983	79 10	5,360	8,774	14,134	1,270	5,542	2,500	2,200	25,646	26,545
30th Nov. ...	13,690	77 15	3,055	10,079	13,134	1,049	1,650	2,700	2,800	21,333	23,365
31st Oct. ...	15,772	71 5	4,445	12,950	17,435	1,136	1,602	2,400	3,800	26,573	26,875
30th Sept. ...	16,304	71 5	5,163	14,129	19,292	1,813	2,771	2,550	2,400	28,826	29,042
31st Aug. ...	17,620	70 10	4,784	12,741	17,475	1,121	4,873	3,400	2,600	29,469	27,965
31st July ...	17,441	68 5	5,602	9,783	15,385	2,406	3,939	1,850	1,400	24,980	25,374
30th June ...	18,035	65 15	4,375	14,683	19,058	978	2,189	1,600	2,700	26,525	25,677
31st May ...	17,227	65 0	3,780	10,593	14,373	2,732	2,912	3,200	1,100	24,337	25,015
30th April ...	18,055	65 17 6	4,291	9,555	13,846	1,745	2,287	2,200	1,000	21,078	19,768
31st March ...	16,745	67 5	5,610	8,874	14,484	1,592	1,841	2,400	800	21,117	21,497
28th Feb. ...	17,125	68 7 6	7,275	11,261	18,536	1,397	4,959	2,300	1,400	28,592	27,203
			57,933	150,933	193,966	19,096	36,696	28,950	24,100	302,808	304,515
31st Jan. ...1905	15,733	68 0	6,948	10,815	17,763	1,130	4,081	1,950	1,000	25,924	26,925
31st Dec. ...1904	16,734	68 2 6	7,199	14,277	21,476	2,479	2,951	2,900	1,400	31,206	30,516
30th Nov. ...	16,044	67 2 6	8,097	14,080	22,177	1,130	941	2,600	1,000	27,838	26,244
31st Oct. ...	13,490	62 12 6	5,140	18,063	23,203	1,033	4,819	2,900	1,200	33,155	33,545
30th Sept. ...	13,878	58 0	5,932	13,105	19,037	1,347	4,737	2,700	1,800	29,621	29,153
31st Aug. ...	13,415	57 5	8,919	11,818	20,767	1,595	3,743	2,300	1,700	29,895	24,547
31st July ...	12,867	57 5	8,646	9,119	17,765	3,855	2,819	2,300	1,600	28,339	26,609
30th June ...	11,137	56 12 6	3,734	8,628	12,362	1,518	4,366	2,800	2,000	23,046	22,732
31st May ...	10,823	56 10	5,409	9,813	15,252	2,123	1,753	2,600	1,600	23,328	24,531
30th April ...	12,026	58 12 6	5,896	13,125	19,021	1,755	4,105	2,900	1,500	29,281	29,751
31st March ...	12,496	57 17 6	9,456	13,441	22,897	594	4,033	2,300	1,400	31,224	30,627
29th Feb. ...	13,299	56 10	10,454	17,383	27,837	2,022	1,568	1,300	1,300	34,027	34,961
			85,830	153,727	239,557	20,581	39,696	29,550	17,500	346,884	345,334
30th Jan. ...1904	14,233	56 7 6	6,285	12,947	19,232	1,524	4,092	2,800	1,800	29,448	28,991
31st Dec. ...1903	13,851	56 17 6	5,157	10,528	15,685	3,183	4,521	3,500	2,100	28,989	27,851
30th Nov. ...	12,743	54 10	3,798	9,060	12,858	1,461	2,403	2,600	1,700	21,022	23,010
31st Oct. ...	14,831	59 5	4,940	7,004	11,944	1,517	4,813	2,700	1,800	22,774	23,097
30th Sept. ...	15,254	55 2 6	2,943	7,742	11,735	1,891	4,474	2,600	1,800	22,500	22,708
31st Aug. ...	15,712	58 7 6	2,947	6,340	9,287	1,538	4,427	2,700	2,000	19,652	18,589
31st July ...	14,949	57 7 6	2,473	5,101	7,574	1,513	4,758	3,100	2,200	19,145	19,449
30th June ...	15,303	58 0	2,142	6,331	8,473	1,547	5,262	1,750	1,800	18,832	19,143
30th May ...	15,764	59 5	3,418	9,196	12,614	1,649	2,494	2,300	2,000	20,957	20,891
30th April ...	15,998	60 10	3,801	9,164	12,965	2,034	6,956	2,550	2,300	26,855	26,641
31st March ...	14,384	64 0	5,748	6,190	11,938	118	4,455	2,650	1,800	21,271	20,229
28th Feb. ...	13,472	59 0	3,289	7,411	10,700	3,122	2,870	2,250	2,000	20,672	22,331
			46,841	98,294	145,135	21,127	51,265	31,300	23,300	272,117	271,100

# New Patents Applied For.

Feb. 5th.—Feb. 10th.

## Engineering—Civil, Mechanical, etc.

**AERIAL TRAMWAYS.**—FRANCIS Edward Dyke Acland and Bernhard Greiff, London. Improvements in and relating to traction rope grips for aerial tramways. 2,739.

**AIR COMPRESSING PUMPS.**—Henry Hartley and Vincent Canova, London. Improvements relating to air compressing pumps. 2,862.

**BOILERS.**—William Byrom, Manchester. Improvements in or relating to smoke preventing and fuel economising apparatus for steam generators. 3,283.  
—Thomas Hudson, London. Improvements in vertical steam boilers. 3,262.

—John Moffat, London. Fuel saving and smoke consuming attachments for boilers. 3,330.  
—Samuel Rothwell, Joseph Lane, George Windsor, and John Robert Booth, London. Improvements in or relating to the construction of fire bridges for steam boilers. 2,983.

**BOILER LEAKAGES.**—David John Morgan, London. Improvements in appliances for finding the position and stopping leaks in boiler and other tubes and tube plates. 2,776.

**CARD INDEXES.**—Anthony Ronald Middlemiss, Yorkshire. Improvements in card indexes and the like. 3,103.

**CHUCKS.**—Benjamin Longbottom and John Henderson Hamilton, Manchester. Improvements in chucks or tool-holders for use in or on drilling or boring machines and other analogous machine tools. 3,056.

**CRANES.**—Emil Hugo Clausnitzer, London. Improvements in and connected with cranes for use with wagons and for like purposes. 2,900.

**FLUID POWER TRANSMISSION.**—Ernst Renner, Marianna Renner, Leo Renner and Anton Renner, London. Improvements in or relating to fluid power transmission apparatus. 2,803.

**FURNACES.**—Percy Priestly, Halifax. Furnace door. 3,444.

—John Wood Leadbeater, London. Improvements in and relating to furnaces for the prevention of smoke. 3,110.

**GAS ENGINES.**—Otto Scharenberg, London. Improvements in and relating to gas-engines. 2,800.

—Friedrich Tempel and Wilhelm Spieler, trading as Deutsche Sauggas Lokomobil-Werke G. m. b. H., London. Improvements in portable and semi-portable suction gas engines. 3,146.

**GAS PRODUCERS.**—Samuel Griffin, Bath. Improvements in suction gas producers. 3,060.

**GOVERNORS.**—John Weller, London. Improvements in engine governors. 2,731.

**MACHINE TOOLS.**—Percy Gentry Bowen, London. Improvements in or relating to machine tools. 3,309.

—Harold Malcolm Duncan and Frank Hinman Pierpont, London. Improvements in or relating to machine tools. 2,995.

**METALLIC TUBES.**—The firm of Mounet et Moyné, London. Process and appliance for bending metallic tubes. 2,901.

**ORIFICE.**—Friedr. Krupp Aktiengesellschaft, London. Improvements in or connected with fluid pressure devices for barrel reool or lance. 3,087.

**PACKINGS.**—Alexander Oldham and Sons, Ltd., and John Boon Manchester. Improvements in the construction of metallic packings for piston rods and the like. 2,860.

**PIPE MOULDING MACHINES.**—Robert Ardelt, London. Improvements in pipe moulding machines. 3,306.

**PUMPS.**—The firm of Gebrüder Sulzer, London. Device for relieving the thrust of centrifugal pumps. 2,796.

**REDUCING VALVES.**—Josef Hubner and Isidor Mayer, London. Improvements in pressure-reducing valves. 3,134.

**SAWING METALS.**—Harry Noble and Pearson Lane, London. Improvements in machines for sawing metals. 2,910.

**SCREW THREADS.**—Paul Gottschalk, London. Improvements in or relating to machines for cutting screw threads. 2,813.

**SMOKE CONSUMERS.**—John Alexander Whaley, London. Improvements in smoke consumers. 2,824.

**SPARK ARRESTERS.**—Erwin Heyber-Gymnich and Georg Thomas, London. Improvements in spark arresters. 2,911.

**STEAM ENGINE.**—Hans Bittinger, London. Improved rotary steam engine. 3,230.

**STEAM POWER.**—Max Reiner, London. Improvements relating to the generation and utilisation of steam for power purposes. 3,113.

**STEAM TRAPS.**—John Charles Bourne and George Hughes Rees, London. Improvements on steam traps. 3,173.

—Alexander Dewar Horne, Glasgow. Improvements in and connected with steam traps. 2,838.

**STUFFING JOINT.**—Paul Finden, Cheshire. Stuffing joint for rotary shafts. 2,846.

**TEA PLANT.**—William Jackson, London. Improvements in feed regulating devices for machines for drying tea-leaves or analogous products. 3,129.

**TUBULAR CONNECTIONS.**—Leo Jolles, London. Method for the production of tubular connections between metal plates. 2,912.

**TURBINE SLOTS.**—The Warwick Machinery Company, Ltd. London. Improvements in and relating to machines for cutting slots in turbine and the like wheels. 3,137.

**TURBINES.**—Clifford Hugh Douglas, London. Improvements relating to turbines, turbo-compressors and the like. 3,112.

—Edward Russell Pearce, London. Improvements in steam turbines. 3,263.

—John Ritchie, Richmond, London. Improvements in and relating to steam turbines. 3,093.

—Richard Schulz, Liverpool. Improvements in guide apparatus for impulse steam turbine having one or more stages of pressure. 2,864.

—Richard Schulz, Liverpool. Improvements in the attachment of steam turbine blades or vanes. 3,015.

—Gordon Ramsay Stuart Stuart, Leamington. Improvements in and relating to turbines. 3,098.

**VALVE GEAR.**—William Eastwood, Halifax. Improvements in and relating to distributing valve gear for steam and other engines. 2,833.



**VALVE GEAR.**—James Thompson Marshall, London. Improvements in valve gear for fluid pressure engines. 2,834.

### Shipbuilding.

- DOCKS.**—Lucien Louis Joseph Merlet, Liverpool. Improvements in and relating to the construction of floating docks and the like. 2,837.
- COVERING BOATS, ETC.**—Frank Samuel Pett, London. Improvements in and relating to gear for raising, lowering and disengaging ship's boats and the like. 2,838.
- PROPELLERS.**—William Miller Walter, Liverpool. Improvements in screw propellers. 2,864.
- PROPELLERS.**—Jose Fola, London. Improvements in propellers. 2,866.
- SHIP TELEGRAPHS.**—Christopher John Monteleone, Liverpool. Improvements in ships or analogous electric telegraphic apparatus. 3,172.
- SUBMARINE BOAT.**—Henry James Wallis, London. A submarine boat for a submarine vessel. 2,867.
- STEERING.**—James Rose, William Hazelwood Carmont, and James St. Clair, London. Improved apparatus or appliances for steering ships or vessels. 2,869.
- TURRET VESSELS.**—Charles David Doxford, Middlesbrough. Improvements in turret or similar vessels. 3,085.
- UNLOADING.**—Georges Legrand, Cardiff. Improvements in and relating to the unloading of bulk cargo such as coal, ore, grain, and the like from ships and loading structures. 29,24.

### Iron and Steel—Metallurgical.

- BRASS TREATMENT, ETC.**—Richard Joseph Crowley and Frederick Fitz Payne, London. An improved method of and means for treating the surfaces of brass, copper and white metal—it may be for the purposes of joining together these metals or otherwise using them. 3,310.
- COPPER WASTE.**—Louis Maurice Ladoutaine, London. New electrolytic process for extracting metals from their ores and the treatment of copper waste for the recovery of pure copper. 2,989.
- IRON ORE REDUCING.**—Philip Arthur Newton, London. An improved process for reducing iron ore. 2,988.
- ORE FEEDERS.**—Charles George Redfern, London. Improvements in automatic ore feeders. 3,023.
- PICKING BANDS.**—George Greaves, Manchester. Improvements in the manufacturing of picking bands. 2,865.
- ROLLING APPARATUS.**—Albert Edwards Hills, Birmingham. Improvement in the rolling of metals. 2,947.
- SCRAP METAL CONSOLIDATION.**—Theodore Zetzel, Essen. A new or improved apparatus for compressing scrap metal, or the like, into compact consolidated blocks. 2,912.
- SLAG TREATMENT.**—Frederick Wallis Stoddart, London. Improvements in the manufacture of filtering media from slag. 3,240.
- SLAG TREATMENT.**—Adolf Gutensohn, London. Improved treatment of slags for the recovery of their metallic contents. 3,317.
- STEEL MIXING.**—Société Electro-Metallurgique Française, London. Electric mixing furnace for mixing steel. 3,004.
- ZINC FUMES.**—George Augustus Mower and William John Bassett, London. An improved method of and apparatus for condensing and collecting fumes from zinc and like furnaces. 2,708.
- ZINC REFINING.**—Jacob Callmann and Rudolf Bormann, Manchester. Improvements in the process of refining zinc and other metals. 3,252.

## Ships Built in 1905.

The annual Return issued by Lloyds' Register shows that the tonnage of vessels launched in the United Kingdom in 1905 was the greatest on record, the aggregate for merchant and war vessels, viz., 1,752,969 tons, being more than 16,000 tons in excess of that for 1901, hitherto the record year.

During the year, exclusive of warships, 725 vessels of 1,623,168 tons gross were launched, an increase of 418,000 tons, or 34·7 per cent., on the figures for the previous year. The previous record tonnage for merchant vessels (1,524,739 tons) was reached in 1901, and the figures for 1905 show an excess of 98,429 tons, or 6·4 per cent., over that total.

The number of warships launched in 1905 was 28, of 129,801 tons displacement, including 46,250 tons built at Royal Dockyards. This aggregate shows an increase of 2,626 tons over that for 1904, but was 82,160 tons less than in 1901, when the tonnage of war vessels launched was the greatest on record.

The following table shows the annual tonnage launched in the last fourteen years:—

Year.	Mercantile and other Vessels (not War Ships).	War Ships.
	Tons (Gross).	Tons (Displacement).
1892	1,107,735	151,117
1893	820,783	48,267
1894	1,407,377	32,277
1895	1,509,077	148,111
1896	1,557,733	163,777
1897	1,524,486	195,477
1898	1,397,370	161,337
1899	1,416,791	168,590
1900	1,442,477	68,364
1901	1,524,739	211,000
1902	1,427,337	74,333
1903	1,190,618	151,890
1904	1,203,142	127,176
1905	1,623,168	129,801

All the principal districts, with the exception of Liverpool and London, shared in the increase in 1905. The following table shows the districts in which the greatest tonnage, including warships, was launched in 1905, with comparative figures for the previous year:—

District.	Total Tonnage, including war vessels launched in		Increase in 1905 over 1904
	1905.	1904.	
Newcastle ... ..	341,424	248,175	93,249
Sunderland ... ..	305,169	229,135	76,034
Glasgow ... ..	299,015	255,455	43,560
Greenock ... ..	230,121	157,688	72,433
Belfast ... ..	142,541	74,251	68,290
Middlesbro' and Stockton	132,748	110,236	22,512
Hartlepoons and Whitby	124,066	96,154	27,912

# New Catalogues.

**Thomas Greenwood, Halifax.**—We have received from the above firm an illustrated list of new and secondhand engineers' tools, including a wide range of lathes, horizontal and vertical engines, etc.

**Mavor and Coulson, Ltd.**—The firm's February card calendar has an illustration showing direct current under-type coal-cutter on skids. On the back of the card is an illustration showing the adaptability of the electrical coal-cutter for working through faults.

**Ed. Bennis and Co., Ltd.**—Attractive pamphlets fully illustrated with line and half-tone blocks describe the firm's recent installations of mechanical coal-handling plant, etc., at London and Coventry. The pamphlets can be had on application.

**General Electric Company, Ltd.**—The firm has issued an illustrated list of electric glow radiators and other apparatus suitable for office or domestic use. The pamphlet contains particulars of a number of new and attractive designs, which will doubtless be much in demand in view of the recent reductions that have taken place in the prices of electric current.

**The Lahmeyer Electrical Company, Ltd.**—An eight-page illustrated circular has been issued listing and describing the firm's "Centrator Motor"—a simple and compact form of electric motor and reducing gear combined. The motion is transmitted by friction discs of small compass, *i.e.*, rolling friction only is employed, thus making the whole practically a noiseless machine.

**Nalder Brothers and Thompson, Ltd., 34, Queen Street, London, E.C.**, have issued a new edition of their recorder catalogue. Attention is particularly drawn to the type of instruments which give a record upon a continuous roll, instead of having the paper perforated, as heretofore has generally been the practice. Needle points are employed to move the paper forward.

**Holden and Brooke, Ltd.**—A postcard illustrates and explains Brooke's patent "Protected Seat" slope valve, which is claimed to offer the best protection against leakage in steam valves. The protection is provided by the extra valve or extension cone, which opens later and closes earlier than the main valve, thus protecting the main valve from the cutting action—the destructive agency in ordinary valves—of the steam at the moment of opening and closing.

**William Butler, 20, Crosley Road, Birkdale, Southport.**—We have already drawn attention to Mr. Butler's adjustable camera stand, which certainly seems worth an inquiry on the part of any engineer who has to take photos in cramped and difficult surroundings. The object of the invention is to facilitate the adjustment of a camera in every conceivable position. It is known as the "Swincam," and its features are described in a new illustrated pamphlet.

**C. W. Hunt Company, New York.**—A descriptive and fully-illustrated pamphlet describes the Hunt "Industrial" narrow-gauge railway. In addition to the component parts of the railway, which are described in some detail, there is an illustrated list of special cars for a great variety of purposes, from the conveyance of material in the pit to transferring 12 in. shot, and carrying liquids. Some suggestive track plans are included, showing an industrial railway equipment for charging a blast furnace, etc. At the end of the pamphlet will be found some detailed memoranda for engineers and architects. As the various cross tracks and switches are made to standard sizes, all the parts are interchangeable, but where special conditions are to be covered, detailed inquiries are invited.

**Abner Doble Company, San Francisco.**—Readers of PAGE'S WEEKLY are already familiar with some of the notable applications of the "Doble" tangential water-wheels. Colonial readers who are confronted with water power problems cannot do better than write to the Company for their latest bulletin, No. 7, which gives an illustrated description of the system, hints on the measurement of water and other useful hydraulic information in tabulated form. Attention is specially called to some hydro-electric units of unusually large capacity, including descriptions of 8,000 h.p. wheels, constructed for the De Sabla electric power houses, and a 9,000 h.p. at present under construction. The latter portion of the book contains "Doble" water-wheel tables, covering all conditions of water power up to a head of 2,550 ft., and in capacities up to 5,000 h.p. Other tables relate to the loss of head in pipe by friction, riveted steel pipes, etc. There are four pages of useful hydraulic information.

**Horsfall Destructor Company, Ltd.**—A useful pamphlet affording the comparison of data from destructor plant has just been issued. The plan adopted has been to devote left-hand pages to views of individual plant, while on right-hand pages are scheduled details showing date of erection, number of cells, system of forced draught, boilers, dustcatcher, chimney, amount of refuse destroyed, steam raised per lb. of refuse, total h.p. available from consumption of refuse, and a statement as to the utilisation of the surplus power. Of special interest are the concluding pages devoted to a portable destructor, clinker crushing mills, mortar mills, clinker railway, and Swain and Harrison's patent furnace for recovering solder from old cans. The following account is given of the latter process: The soldered tins are collected and tipped into the oven. In the course of three or four minutes the solder will be seen running out in a stream through the shoot which leads it into the receiver. The attendant moves a handle, which causes the tins to fall on to the lower set of bars, where they are raised to a red heat and the tip completely burnt off. The process occupies about an hour. The fuel is placed on a set of fire bars near the bottom of the oven, or the heat may be obtained from the destructor flue. Wages may be considered practically the only cost of working the furnace, as the heat may be obtained from the combustion of rubbish.



**Turner, Atherton and Co., Ltd., Denton, Manchester.** A number of testimonials are bound up in a neat little brochure dealing with Turner electric lifts, installed for goods and passenger work in London and the provinces. Illustrations are included showing overhead and basement gear for electric lifts. The cover has been very attractively reproduced from a moulded design, with a centre and front and back illustrating basement gear for passenger lifts.

### Books Received.

**"Electricity Meters":** A Treatise on the General Principles, Construction, and Testing of Continuous Current and Alternating Current Meters, for the use of Electrical Engineers and Students. By Henry G. Solomon, A.M.I.E.E. Charles Griffin and Co., Ltd.

**"The Metallurgy of Gold."** By T. Kirke Rose, D.Sc., being one of a Series of Treatises on Metallurgy, written by Associates of the Royal School of Mines. Fifth edition. Charles Griffin and Co.

**"The Fleet Annual and Naval Year Book, 1906."** Compiled by Lionel Vexley. The Westminster Press. (Gerrard's, Ltd.) 1s. and 2s. 6d. net.

**"Notes on the Home Office Rules for the Use of Electricity in Mines."** By W. C. Mountain. Walter Scott Publishing Co. 2s. 6d.

**"Industrial Efficiency."** A Comparative Study of Industrial Life in England, Germany, and America. Arthur Shadwell, M.A., M.D. Two volumes. 26s. net.

**"Continuous Current Armatures":** their Windings and Construction. A Handbook for Students, Designers, and Practical Men. By C. Kinzbrunner, A.M.I.E.E. Harper and Bros. 3s. 6d. net.

**"Alternating Current Windings":** their Theory and Construction. A Handbook for Students, Designers, and Practical Men. By C. Kinzbrunner, A.M.I.E.E. Harper and Bros. 3s. 6d.

**"Constructions of Electric Machines and Apparatus."** Edited by C. Kinzbrunner. Part I.: Switchboard Apparatus. Harper and Bros. 2s. 6d.

### Changes of Address, etc.

Announcements of changes in firms and their addresses notices of new works or extensions, are invited for inclusion in this column.

**SWALES BROS. LTD.** of Beccord have opened an office in West India-quay, Leadenhall Street, London, E.C., which will be under the charge of Mr. Lewis Evans, M.I.N.A., who has recently joined the Board of directors of this company.

**JEKINS BROS.** have removed from 62 Watling Street to 95, Queen Victoria Street, London, E.C.

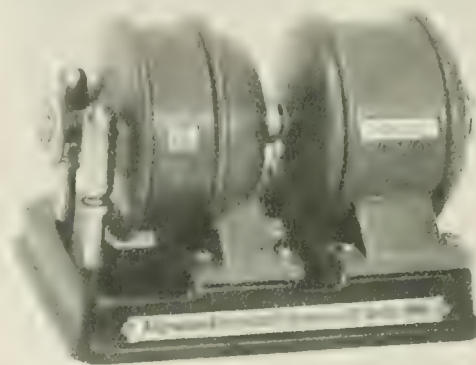
**THE WILKINS WIRE ROPE COMPANY, LTD.** have removed their works from Wapping to Eastwood, Notts.

**WILLIAM JACKS AND CO.**, iron and steel merchants, Glasgow, Middlesbrough and London, have taken into partnership Mr. Robert Hetherington and Mr. H. Arnold Wilson, who have been associated with the firm for a number of years.

**THE NORTH LASHLEY STEEL COMPANY, LTD.** have moved their London office from Cannon Street to Bridge Row, Cannon Street, E.C.

**MR. C. F. MONCKTON, M.I.E.E.** consulting electrical engineer, has removed to Portico, Mansion, Victoria Street, Westminster, S.W.

A novel calendar issued by the Allgemeine Elektrizitäts-Gesellschaft is built up in the form of one of their steam turbo-generator sets with slots for the appearance of the month and date. The calendar



as will be seen from the illustration, is a neat little model which seems likely to be of service for many years to come.

### Forthcoming Exhibitions.

#### Great Britain.

Bath and West of England Agricultural Society, Swindon, May 11—June 5, 1906.

Royal Agricultural Society's Show, Derby, June 27—30, 1906.

Bath and West of England Agricultural Society, Newport, Mon., 1907.

London. Engineering and Machinery at Olympia, September 15 to October 7, 1906.

London. Austrian Exhibition, Earl's Court, May—October, 1906.

#### Abroad.

Bucharest International, June 1—December 1, 1906.

Milan International, May—October, 1906.

Motor Cars, International, Turin, February, 1906.

Nuremberg General Industrial, May—October, 1906.

Agricultural and Preserved Food Products, Berlin, June 21—25, 1906.

Fine Arts and Industries, Paris, June—October, 1906.

Motor Cars, Buenos Aires, September, 1906.

Egypt International, November—February, 1907.

Christchurch, New Zealand, November, 1906—April 1907.

### MEETINGS, ETC., FOR THE ENSUING WEEK.

**FRIDAY, FEB. 23.** Royal Institution, Albemarle Street, at 8 p.m. Lecture by Professor F. O. Arnold, "The Internal Architecture of Metals." Institution of Civil Engineers, Great George Street, S.W., Students' Meeting 8 p.m. Paper, "The Graphical Determination of the Detection of Beams," by Mr. C. H. Sommer. Institution of Electrical Engineers (Manchester Students' Section) Annual Dinner. Institution of Marine Engineers, Bohemian Concert.

**SATURDAY, FEB. 24.** Association of Engineers-in-Charge. Social Meeting, St. Bride's Institute.

**MONDAY, FEB. 26.** Institution of Marine Engineers, Stratford, 8 p.m. Paper, "The Invention of the Steamboat," by Mr. J. H. H. B. Manchester Association of Engineers, Manchester School of Technology. Paper, "The Textile Industry," Mr. W. H. Cook and Mr. Joseph H. Stubbs.

**TUESDAY, FEB. 27.** Institution of Civil Engineers, Great George Street, 8 p.m. Frameworks and Light Railways Association. Meeting at Society of Arts, 8 p.m. Lecture on "Rack and Pinion," by Professor C. A. C. Wilson, M.A. Association of Engineers.

**WEDNESDAY, FEB. 28.** Society of Arts, 8 p.m.

**THURSDAY, MARCH 1.** Royal Society, Burlington House, W., at 1304 m. Civil and Mechanical Engineers' Society, Cannon Hall, Westminster, 8 p.m.

**FRIDAY, MARCH 2.** Institution of Engineer, Westminster Palace Hotel, 8 p.m. Paper, "Gas Engine Indicators," by Mr. L. L. P. P. P. P.

# J. POHLIG, LTD., COLOGNE.

Cheapest and most reliable  
System of Transport.

**"OTTO"**

More than 1,600  
Lines at work.

## Aerial Ropeways

Absolutely Independent of Formation of Ground.  
Working Unaffected by Climate.  
Skilled Labour not necessary to work them.  
Wear and Tear Reduced to a Minimum.

Special Department :

**MODERN HOISTING AND  
CONVEYING MACHINERY.**

Representative:

R. E. COMMANS,  
6, Queen Street Place, LONDON, E.C.

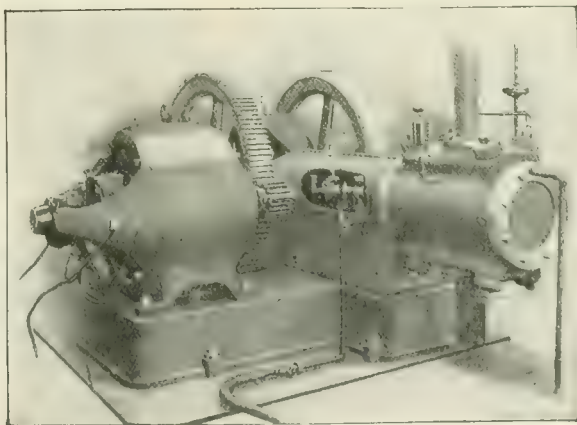


Telegraphic Address:—  
"CAULKING, LONDON."

Telephone -  
No. 3987 GERRAR

**BELT, STEAM  
AND  
ELECTRICALLY  
DRIVEN  
AIR COMPRESSORS  
SPECIALLY  
DESIGNED FOR  
THE OPERATION  
OF  
PNEUMATIC TOOLS.**

**ELECTRIC  
DRILLS AND HOISTS.**



FRANKLIN AIR COMPRESSOR, CLASS G.S.E. GEARED TO ELECTRIC MOTOR.

**BOYER RIVETING  
CAULKING,  
AND  
CHIPPING  
HAMMERS.  
LITTLE GIANT  
WHITELAW,  
AND BOYER  
PNEUMATIC DRILLS.  
KELLER HAMMERS  
AND DRILLS.**

**Works: FRASERBURGH, N.B.**

**On Admiralty and War Office Lists.**

**THE CONSOLIDATED PNEUMATIC TOOL CO., Ltd.**

General Offices: PALACE CHAMBERS, 9, BRIDGE STREET, WESTMINSTER, S.W.

Workshops and Showroom within a few minutes' walk of the Offices, where Tools can be seen in operation.



# Westinghouse Single-Phase Railway System.



Westinghouse Single-Phase Locomotive, 1,800 h.p.

The More Conspicuous Advantages are:—

- Reduced cost of power equipment.
- Reduced cost of line construction.
- Reduced cost of operation.
- Reduced cost of maintenance.
- Reduced line loss.
- Increased radius of operation from a single station.
- Elimination of the rotary converter sub-station.
- Elimination of sub-station attendants.
- A more substantial line construction.
- A decreased potential at the motor.
- A more economical and effective speed control.
- A better voltage regulation—consequently a more reliable and better service.
- Decreased danger of equipment from lightning.
- Entire absence of electrolytic action.

The British Westinghouse Electric & Manufacturing Co., Ltd.,  
LONDON. Branch Offices in all Large Towns. MANCHESTER.

## TEMPERLEY TRANSPORTERS

For Rapid and Economical Handling of General Cargo, Coal, Ore, &c.

See our Advertisement in last week's issue.

**TEMPERLEY TRANSPORTER CO.,**  
72, Bishopsgate Street Within,  
LONDON, E.C.

Telephone: London Waa. Telegrams: Transmo.

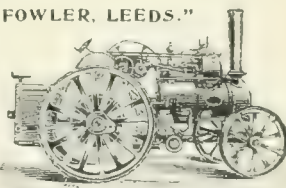
## JOHN FOWLER & CO. (Leeds), Ltd.

Steam Plough Works, LEEDS.

Telegrams: "FOWLER, LEEDS."

Manufacturers of

### Traction Engines,



Steam Rollers, Portable Railways, &c., &c.

## BALDWIN LOCOMOTIVE WORKS.

BROAD AND NARROW GAUGE

# Locomotives

SINGLE EXPANSION & COMPOUND

Mine,  
Furnace and  
Industrial  
Locomotives.



Electric  
Locomotives  
with  
Westinghouse  
Motors and  
Electric Trucks.

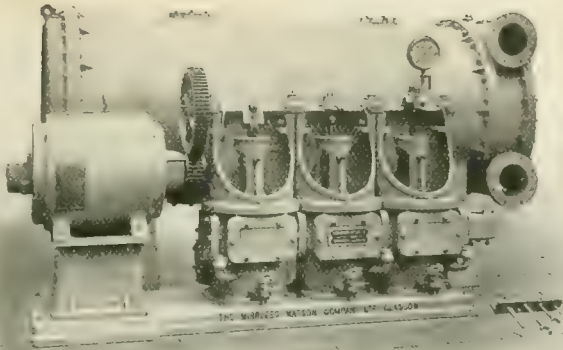
**Burnham, Williams & Co., Philadelphia, Pa., U.S.A.**

Cable Addresses: "Baldwin, Philadelphia"; "Sanders, London."

General Agents: **SANDERS & CO.** 110, Cannon St., London, E.C.

PAGE'S WEEKLY

Oil Engines



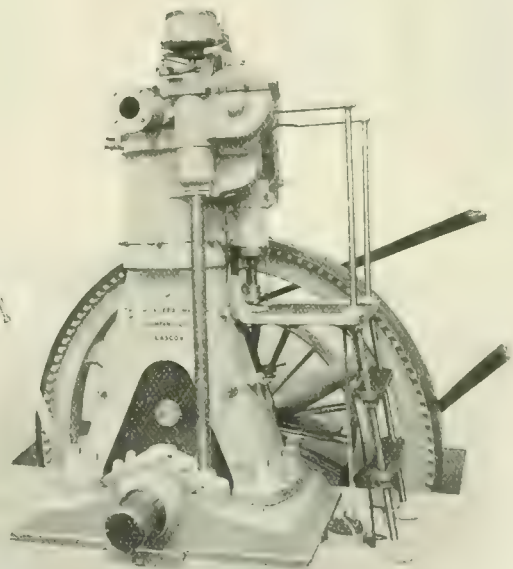
## Condensing Plant . .

OF EVERY  
DESCRIPTION.

Speciality :—  
HIGH VACUUM.

## THE DIESEL OIL ENGINE

IS THE MOST  
ECONOMICAL  
ENGINE MADE,  
AND IS  
MORE RELIABLE  
THAN ANY OTHER  
OIL ENGINE.



**THE MIRRLEES WATSON Co., Ltd.,**  
GLASGOW.

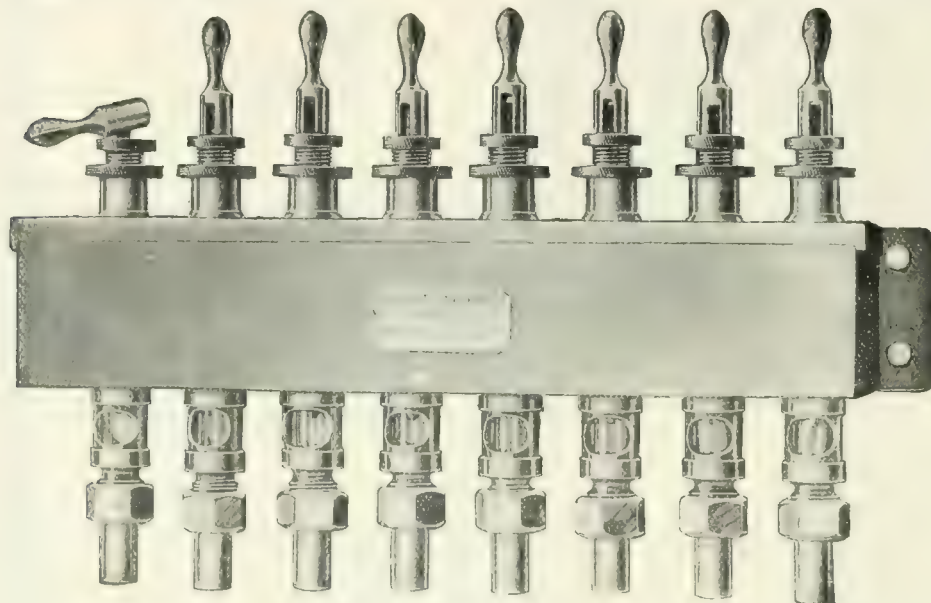




# HUNT & MITTON, ENGINEERS, BRASSFOUNDERS, &c., *Crown Brass Works, Oozells Street North,* **Birmingham.**

Telephone No.: 394.

Telegraphic Address: "MITTON, BIRMINGHAM."



Cast Brass Oil Box, No. 1055.

Makers of

**CAST BRASS  
OIL BOXES.**

**SHEET BRASS  
OIL BOXES.**

Fitted with Sight Feeds or Cocks.

**SIGHT FEED  
LUBRICATORS.**

**Steam Cylinder  
Lubricators.**

**DISPLACEMENT  
LUBRICATORS.**

**Solidified Oil or  
Grease Cups.**

**STAUFFER  
LUBRICATORS,**

&c.

**Sole Makers of  
Holliday's Patent  
Oil Box.**

This box is made of  
Polished Sheet Brass,  
and is fitted with two  
or more feeds as re-  
quired, each feed may  
be worked separately  
or all at one time.

**OIL BOXES AND  
LUBRICATORS MADE  
TO CUSTOMER'S  
OWN  
REQUIREMENTS.**



Holliday's Oil Box, No. 1054.

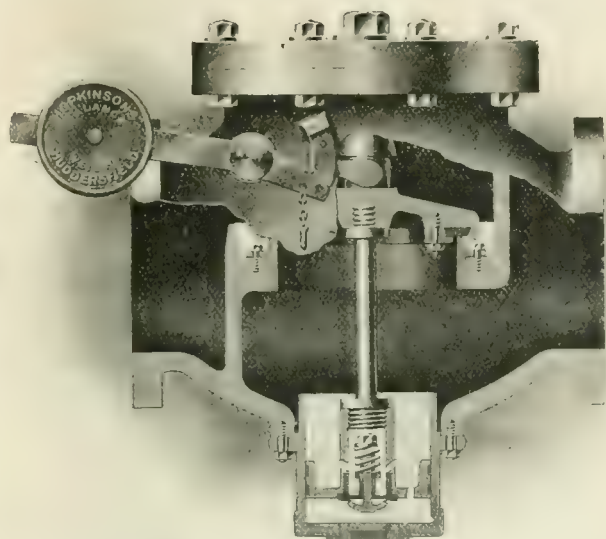
.. Makers of all kinds of.

**Hunt & Mitton,**  
Oozells Street North,  
**BIRMINGHAM.**

**OIL BOXES and LUBRICATORS, STEAM FITTINGS,  
ENGINE and BOILER MOUNTINGS, HYDRAULIC  
FITTINGS, PRESSURE GAUGES, &c.**

# PAGE'S WEEKLY Valves, &c.

Specify Hopkinson's Patent Safety Boiler Mountings.



## HOPKINSON'S "SILENT" AUTOMATIC EXHAUST VALVE.

Specify Hopkinson's Fig. No. 7050.

WRITE FOR LISTS—

### J. HOPKINSON & CO., LTD., HUDDERSFIELD.



### J.B. TREASURE & CO.

*Excelsior Fire-Polished*

### GAUGE GLASSES,

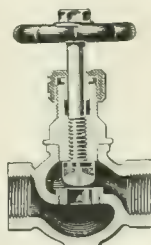
LUBRICATORS,

### INDIA-RUBBER WASHERS,

&c., &c.

### Vauxhall Road, Liverpool.

## The "SHAW" Patent Steam Valves . .



With Renewable Seats, Interchangeable Concentric Valve, Compound Packing to Spindle, Special Metal, and High-Class Workmanship.

The "SHAW" Patent Parallel Slide Valve is the Acme of Simplicity and Durability.

**Try Them!** Sent on Approval.



Write for particulars of these and other Specialities for High Pressure Steam.

JOSEPH SHAW, B Dept., HUDDERSFIELD.  
Albert Works

## If you have a friend abroad,

send us his name and address, together with your own—a postcard will do—and we will send him free a copy of the next issue of PAGE'S WEEKLY.

## It would please him still more

if you subscribed at once for a copy to be sent to him each week for a half-year (13s.), or a whole year (25s., postage included). We would advise him of your subscription, and post the copies regularly in time for the Friday and Saturday foreign mails.

Address: The PUBLISHER (Foreign Circulation), PAGE'S WEEKLY, Clun House, Surrey Street, Strand, London, W.C.



PAGE'S WEEKLY

Wire Ropeways

# ADOLF BLEICHERT & CO., LEIPZIG-GOHLIS.

GERMANY

OLDEST AND LARGEST

FACTORY FOR  
THE CONSTRUCTION  
OF

BLEICHERT'S

# WIROPEWAYS

More than 1,600  
Plants were con-  
structed by us,  
some of a length  
of 34 kilometres.

30 Years'  
Experience.

Gold Medals.  
Highest Awards.



Best and . . .  
cheapest medium  
of transportation  
for all kinds of  
material for any  
distance and . . .  
within factories.

All topographical  
difficulties over-  
come by our .  
Patent Jaw-Grip  
Coupling . . .  
Apparatus. . .  
"Automat."

We have built  
plants with . . .  
gradients of 1:1,  
and spans of over  
1,000 metres.

First-class . . .  
references from  
first-rate houses.

Wire-Ropeway executed for Sucreries Centrales de Wanze Soc. Anonyme, Wanze (Belg.).

Special Department for the Construction of

# HOISTING & CONVEYING MACHINES, CRANES.

# PAGE'S WEEKLY Conveyors & Elevators

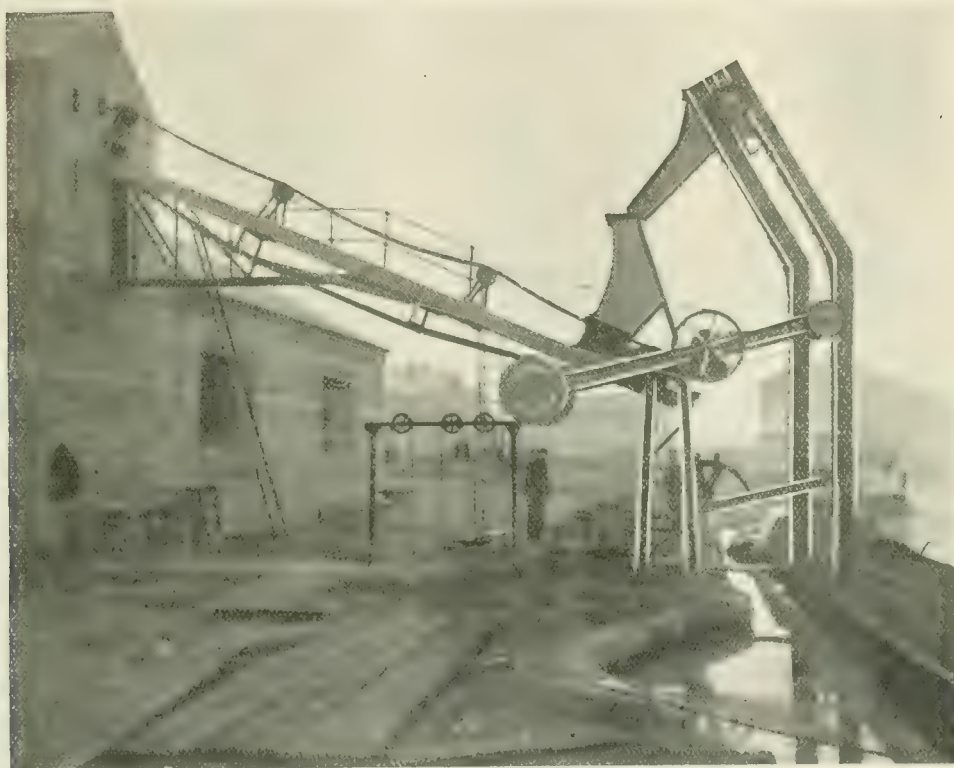
## "BENNIS" CONVEYORS "BENNIS" ELEVATORS

TIME.  
ENERGY.

SAVE

MONEY.  
TEMPER.

Bennis Elevators and Conveyors handle all CLASSES OF MATERIALS  
AND  
CAN BE INSTALLED ANYWHERE AND EVERYWHERE.



COVENTRY BARGE ELEVATOR.

"BENNIS" ELEVATING AND CONVEYING PLANT is at work in—

*Power Stations  
Collieries  
By the Waterside*

*Granaries  
Gas Works  
Warehouses*

*Factories  
Breweries  
Mills, &c.*

Transporting Hundreds of Thousands of Tons of Material.

*Saving and Conserving everywhere.*

WRITE FOR FREE DESCRIPTIVE BOOKLETS TO—

# BENNIS, LITTLE BOLTON, HULTON,

And 28, VICTORIA STREET, LONDON.

Telephone Nos.: 13, FALMOUTH; 627. VICTORIA.



# PAGE'S WEEKLY

## Miscellaneous



**HERBERT W PERIAM LTD.**  
**FLOODGATE ST WORKS**  
**BIRMINGHAM.**

TELEGRAPHIC ADDRESS  
 "FLOODGATE" BIRMINGHAM.

TELEPHONE NO 373.  
 STOCK 250,000. GROSS



# MASCHINENFABRIK SACK, G.m.b.H.,

**RATH, near DUSSELDORF, GERMANY.**

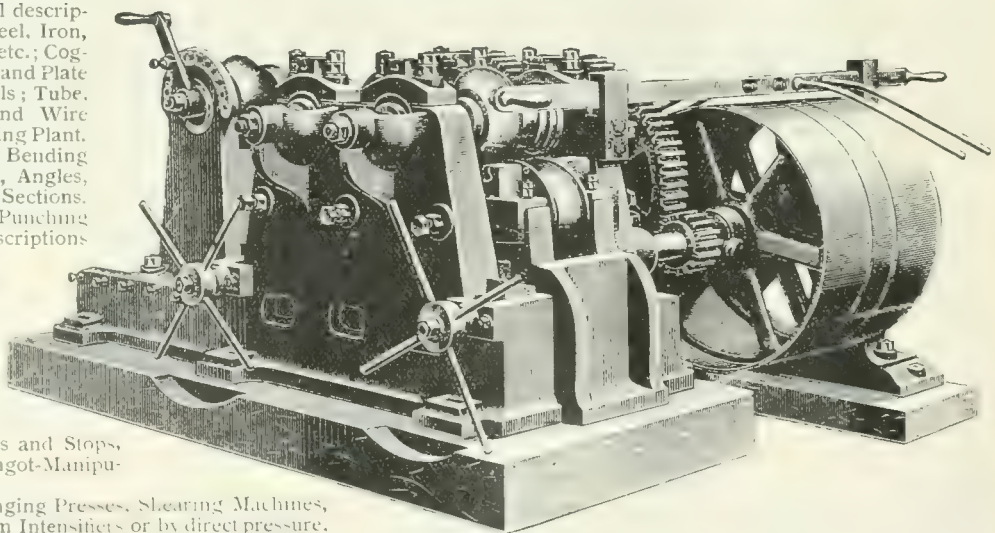
Rolling Mills of all descriptions for Rolling Steel, Iron, Copper, Brass, Zinc, etc.; Cogging Mills; Rail, Bar and Plate Mills; Universal Mills; Tube, Tyre, Disc-wheel and Wire Mills; also Cold-rolling Plant.

Straightening and Bending Machines for Plates, Angles, Rails and other Sections. Shearing and Punching Machines of all descriptions and sizes.

Special Machines for Ship Yards.

All Machinery and Apparatus used in Rolling Mills; Live Roller Racks, Lifting Tables, Straightening Plates, Hot Beds, Conveyors, Hot-Saws and Stops, Charging Devices, Ingot-Manipulator, etc.

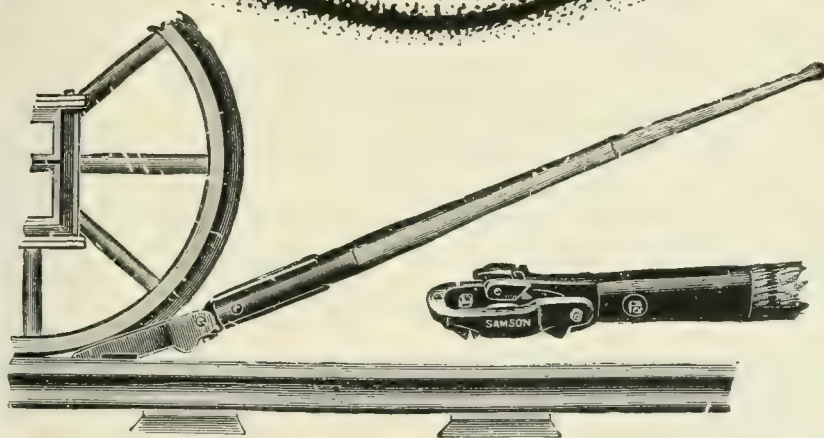
Forging and Flanging Presses, Shearing Machines, etc., worked by Steam Intensifiers or by direct pressure. Hydraulic Pumps and Valves.



**THE ERECTING SHOP OF THE MASCHINENFABRIK SACK CAN DEAL WITH PIECES WEIGHING UP TO 60 TONS.**

# PAGE'S WEEKLY Railway Pinch Bars

## "SAMSON" PINCH BARS



Used by the chief British Railways and a large number of those abroad.

SPECIALLY USEFUL FOR COLLIERIES  
AND FIRMS WITH SIDING CONNECTIONS,  
AND IS A GREAT LABOUR-SAVING TOOL  
WHERE WAGONS OR LOCOMOTIVES  
REQUIRE MOVING SHORT DISTANCES.

### SAMSON & CO.,

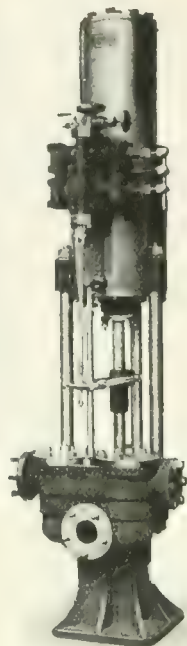
Garforth, near LEEDS.

Telegrams: "SUTTON, GARFORTH."



PAGE'S WEEKLY

Pumps, &amp;c.



# BOILER FEED PUMPS

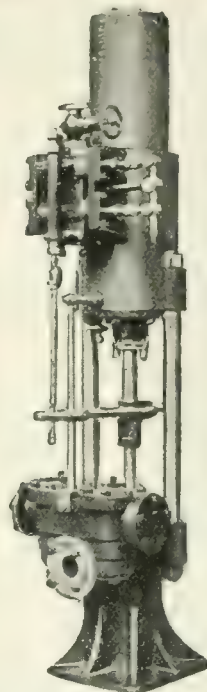
(Hall's Patent.)

ECONOMICAL

AND

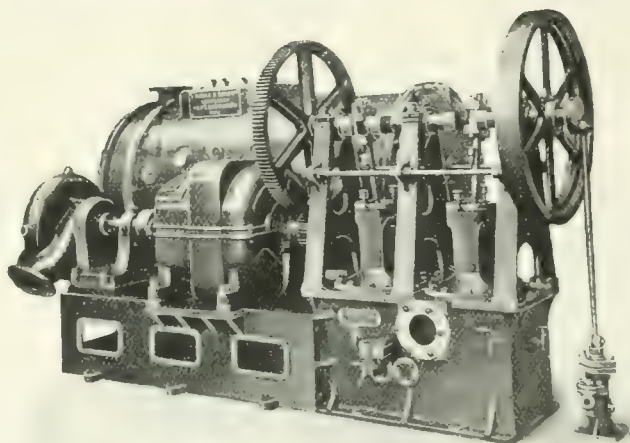
EFFICIENT.

An IDEAL PUMP for General Boiler  
Feeding Purposes.



## CONDENSING PLANT.

This set to  
deal with  
10,000 lbs.  
Exhaust  
Steam  
per hour.



WE MAKE  
**Motor**  
and  
**Steam**  
**Driven**  
**Plants.**

Specially  
Suited for  
Electric  
Light and  
Power  
Stations.

### J. P. HALL & SONS, LTD.,

Engineers, PETERBOROUGH.

South African Agent: Mr. JAMES CLAYTON, JOHANNESBURG.

# PAGE'S WEEKLY

## Miscellaneous

### BORING TOOLS AND PUMPS

BY

## JOHN Z. THOM,

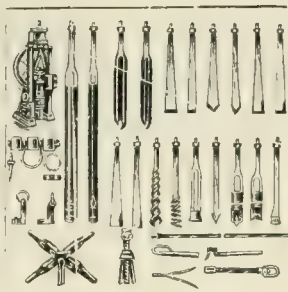
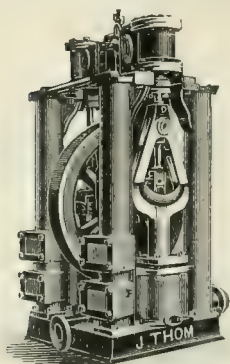
Canal Works,  
PATRICROFT,  
Near MANCHESTER.

Contractor to



H.M. Government.

Telephone: 64 Bades.  
Telegrams: "Th. m. Patricroft."

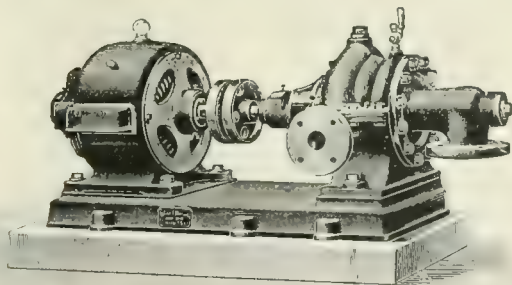


### HIGH LIFT

## Centrifugal Pumps

MOST SUITABLE AND MOST ECONOMICAL PUMPS  
FOR ALL ELECTRICAL AND INDUSTRIAL SERVICES.

### OUR SPECIALITY.



Made for any capacity for all lifts, with highest efficiency,  
specially for direct coupling with Electromotors, also  
high-speed Electrical Plunger Pumps for all services.

**WEISE & MONSKI,**  
HALLE, O.S. (Germany).



## JOHN GIBBS & SON'S

### Ventilating and Dust Collecting Plant

for Polishing and Grinding Shops, etc., showing our "Peerless" Apparatus for removing dust direct from the polishing bobs before it has had time to spread about the room, together with our "Peerless" Dust Separator for collecting the dust, and so preventing it causing trouble by escaping on to the roofs of neighbouring buildings, stopping gutters, etc. Of great service where the dust is of value, as in woodworking machinery and mills where the produce is saleable, and will soon pay for the first outlay.

Messrs. JOHN GIBBS & SON will be pleased to arrange schemes and furnish full particulars to suit the circumstances of each special case on application.

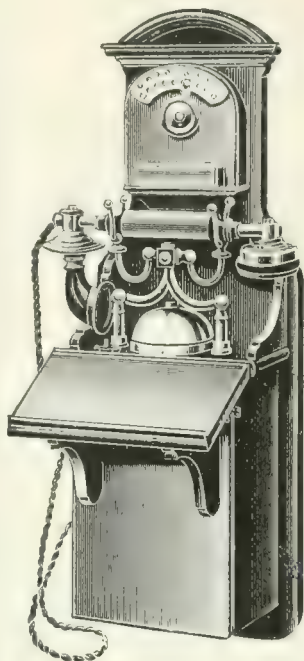
80, JUKE STREET, LIVERPOOL.

TELEGRAMS:  
"Ventilation, Liverpool."

TELEPHONE:  
No. 2579 Royal



# PAGE'S WEEKLY Electrical Apparatus



## SECRECY

GUARANTEED

NONE CAN INTERRUPT.  
NONE CAN OVERHEAR.

either by accident or design.

NO INDICATORS NEEDED.  
NO RESETTING REQUIRED.

Instruments therefore neat and compact.

SIMPLICITY ITSELF.  
SAVES TIME and TEMPER.

Adopted by H.M. Office of Works, Admiralty, &c., &c.

SEND FOR DESCRIPTIVE CATALOGUE **S.T.P.**

PATENTEES AND SOLE MAKERS:—

**GENT & CO., Ltd.,** Faraday Works,  
**LEICESTER.**

Or call at our Showrooms, 3a, Upper Thames St. (opposite "Times" office).

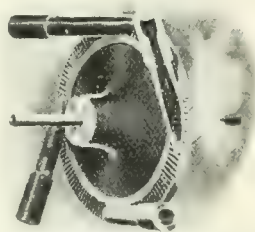


**WINN'S**

RELIABLE  
FIRE APPLIANCES

CHARLES WINN & CO.  
LONDON

**GREENWOOD & BATLEY, L<sup>d</sup>.**  
**LEEDS.**



Machine Tools.

Dynamos & Motors.

De Laval's Patent  
Steam Turbines.

## STEEL CONSTRUCTION

IN ALL BRANCHES

Buildings Designed and Erected in all Parts of the World.

ROOF FRAMES, TRUSSES AND GIRDERS.

BLAST FURNACES AND STEEL WORKS, CUPOLAS, LADLES, CONVERTERS,  
BOILERS, TANKS, AND HEAVY PLATE WORK.

GAS HOLDERS, PURIFIERS, ETC.,

OPEN HEARTH FURNACE CASINGS.

CHIMNEYS, RIVETED PIPE, CORRUGATED IRON.

**RITER-CONLEY MFG. CO., PITTSBURG, P.A., U.S.A.**

New York Office: 39-41, Cortlandt Street.

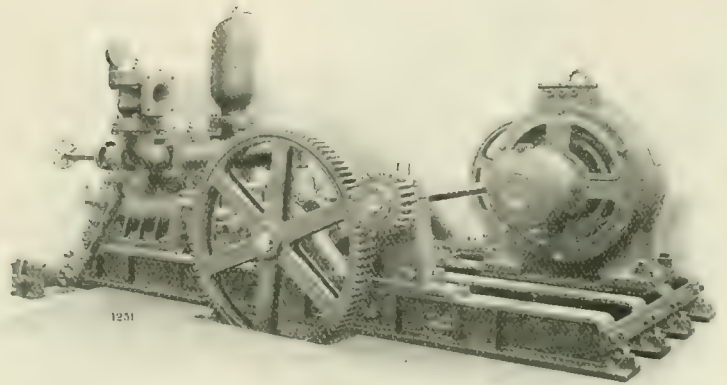
# PAGE'S WEEKLY Electrical Apparatus

## ELECTRICAL MACHINERY

OF ALL DESCRIPTIONS CAN BE OBTAINED FROM

**ERNEST  
SCOTT &  
MOUNTAIN**

LTD.



**NEWCASTLE-ON-TYNE.**

This Illustration shows one of our Mining Pumps and Motors made for the Bengal Coal Co., Ltd., India.



Note the Name and Address:

**T. W. BROADBENT,**  
Victoria Electrical Works,  
EAST PARADE, HUDDERSFIELD.

This picture represents an Electrical Engineering Works in Yorkshire, which is specially laid out for the manufacture of Dynamos, Motors, Switches, and Switchboards. Everything is of the best; and prices are the lowest possible, consistent with best material and workmanship.

Write for Prices and Particulars

OF OUR  
**NEW "STANDARD"  
MACHINES.**

They will  
interest  
you

BEST  
MATERIAL,  
WORKMANSHIP  
AND DESIGN.

**Dynamos "P.D.M." Motors**

**PHŒNIX DYNAMO  
MFG. CO., Ltd.,**

Thornbury Works, BRADFORD.

LONDON OFFICE: 17, Victoria St. Westminster, S.W.

Telegraphic Address: Phoenix London Telephone: 101 Victoria

AKTIENGESSELLSCHAFT

*Mix & Genest*

Telephone and Telegraph Works

**BERLIN, W.**

INSTRUMENTS OF BEST AND APPROVED CONSTRUCTION.

Illustr. Catalogues supplied to the TRADE only.

**Telephone Apparatus**

For Domestic Use, Town Lines, and Long Distances, with Battery and Magneto Call.

**Central and Multiple**

.. Switchboards.

**Electric Bells, Indicators,**

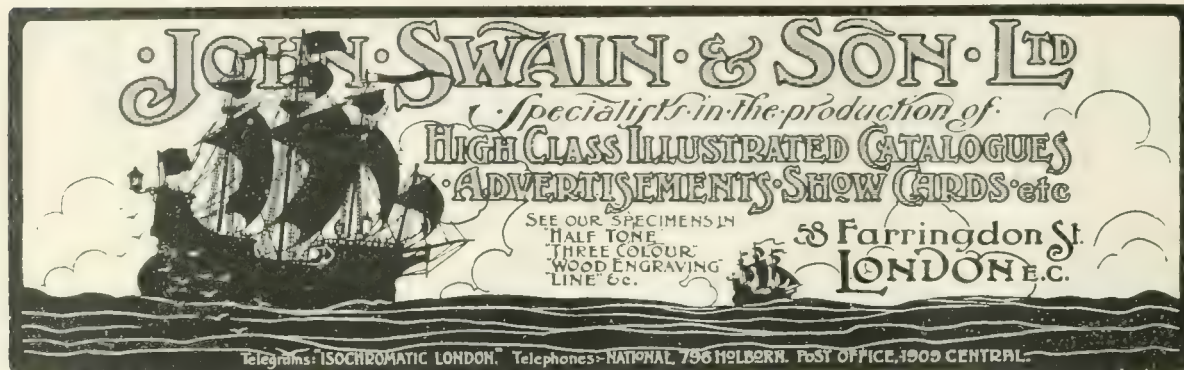
**Fire Alarms,**

**Water Level Indicators.**

ALL ACCESSORIES AND OTHER MATERIALS.



# PAGE'S WEEKLY Engineers' Appliances



**JOHN SWAIN & SON LTD**  
*Specialists in the production of*  
**HIGH CLASS ILLUSTRATED CATALOGUES**  
**ADVERTISEMENTS SHOW CARDS etc**  
 SEE OUR SPECIMENS IN  
 HALF TONE  
 THREE COLOUR  
 WOOD ENGRAVING  
 LINE &c.  
 8 Farringdon St.  
 LONDON E.C.

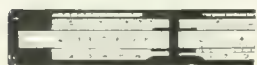
Telegrams: ISOCHROMATIC LONDON. Telephones: NATIONAL 796 HOLBORN. POST OFFICE, 1909 CENTRAL.

## No Office is Complete WITHOUT THE Lyle Filing System.

SEND FOR CATALOGUES TO

**The LYLE COMPANY, Ltd.,**

26, Harrison Street, Gray's Inn Road, LONDON.



### CELLULOID SLIDE RULES.

UNIVERSAL DRAFTING MACHINE.

Piece Work, Balance and Premium Calculator.

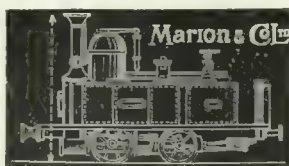
Drawing Instruments.

See id for Pamphlets.

**JOHN DAVIS & SON**  
 (Derby), LTD.

30, All Saints Works, DERBY, and  
 36L, Camomile Street, LONDON, E.C.

### PLAN-COPYING PAPER & LINEN.



MARION'S world-renowned  
 PLAN COPYING PAPERS  
 and LINENS and LINEN  
 BACKED PAPERS, giving  
 Blue, Black, and Brown Lines  
 on White Ground, or vice-versa.

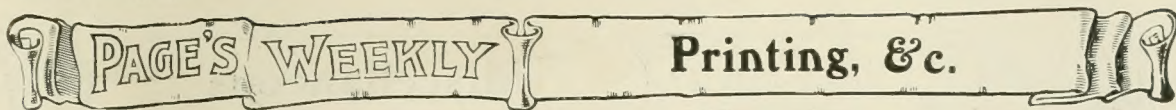
THE FINEST ON  
 THE MARKET.

FOR ENGINEERS & ARCHITECTS.

Descriptive Booklet, Specimen Prints, and Price List post free on  
 application.

**MARION & CO., LTD.,**  
 22 and 23, Soho Square, LONDON, W.





# Arthur Stafford & Co.

Read what the  
"Caxton Magazine"  
the Official Organ of  
the Printing and  
Kindred Trades, says  
about our Printing.

"An illustrated  
Catalogue printed by  
Messrs ARTHUR  
STAFFORD & CO.,  
Denton, is a decidedly  
up-to-date specimen  
of typography and  
half-tone printing,  
and reflects the  
highest credit on the  
producers."

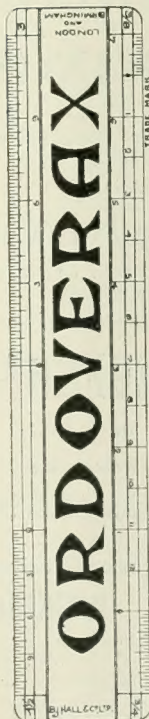
"An extremely  
tasteful piece of work,  
perfectly produced."

## HIGH GRADE PRINTERS

of Engineers' Catalogues, &c.,  
at the Best Prices.

Modern  
Printing  
for  
Modern  
People.

Central Printing Works, DENTON,  
MANCHESTER.



### THE New True Scale Photo Process.

ENGINEER'S TRACINGS CAN BE COPIED ON . .  
TRACING CLOTH, DRAWING PAPER, WHITE CLOTH.

No Washing. No Shrinkage. Twelve Copies for One Exposure.

*We make the Copies or sell Complete Outfits.*

**B. J. HALL & CO., Ltd.,**

39, Victoria Street, LONDON, S.W.



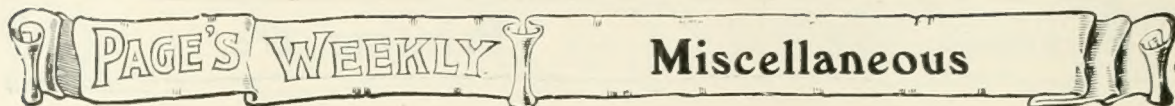
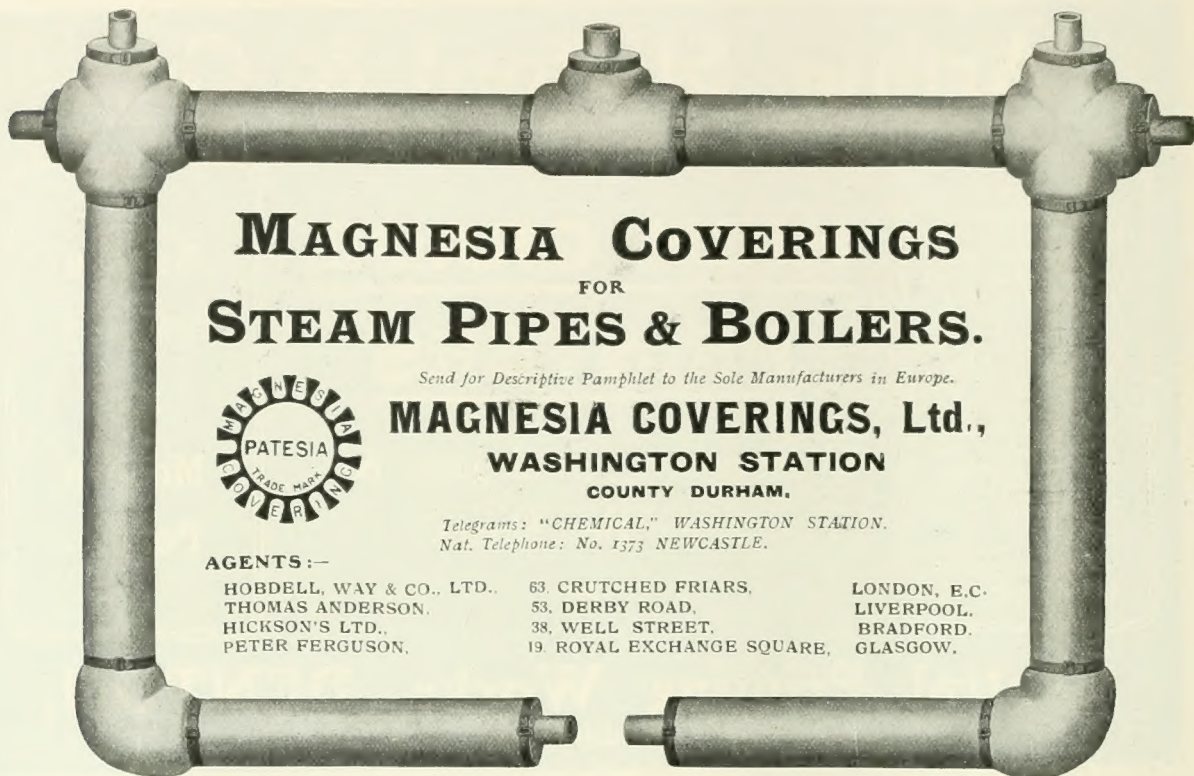
SPECIAL QUICK DRYING AND OPAQUE INKS.

## BUSINESS SYSTEMS.

Cut out this Coupon and indicate in the list below what  
P-81. systems you are interested in, then send to  
**ROCKWELL-WABASH CO., Ltd.,**  
69, Milton Street, London, E.C.,  
who will send you Information Forms relating to same.

- |  |                                     |
|--|-------------------------------------|
| 1. Factory Costs                       | 14. Credit Ratings                  |
| 2. Stores Ledgers                      | 15. Shareholders' Register          |
| 3. Perpetual Card Ledgers              | 16. Filing Catalogues               |
| 4. Quotations—Given                    | 17. Filing Correspondence           |
| 5. Quotations—Received                 | 18. Filing Invoices                 |
| 6. Advertising Records for Advertisers | 19. Pattern Records                 |
| 7. Advertising Records for Agents      | 20. Drawing Records                 |
| 8. Advertising Records for Publishers  | 21. Order Systems                   |
| 9. Staff Register                      | 22. Doctors, Dentists, and Oculists |
| 10. Customer's Lists                   | 23. Membership Records              |
| 11. Addressing Lists                   | 24. Insurance Records for Companies |
| 12. Follow-Up-Systems—Sales            | 25. Insurance Records for Brokers   |
| 13. Follow-Up-Systems—Overdue Accounts | 26. Insurance Records for Agents    |




## MAGNESIA COVERINGS

FOR

## STEAM PIPES & BOILERS.



*Send for Descriptive Pamphlet to the Sole Manufacturers in Europe.*

### MAGNESIA COVERINGS, Ltd.,

**WASHINGTON STATION**  
**COUNTY DURHAM.**

*Telegrams: "CHEMICAL," WASHINGTON STATION.*  
*Nat. Telephone: No. 1373 NEWCASTLE.*

**AGENTS:—**

HOBDSELL, WAY & CO., LTD., THOMAS ANDERSON, HICKSON'S LTD., PETER FERGUSON,	63, CRUTCHED FRIARS, 53, DERBY ROAD, 38, WELL STREET, 19, ROYAL EXCHANGE SQUARE,	LONDON, E.C. LIVERPOOL, BRADFORD, GLASGOW.
--	---	---

## W. C. HOLMES & Co.,

ENGINEERS,  
Sole Makers of the . .

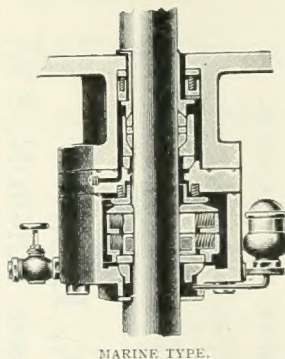
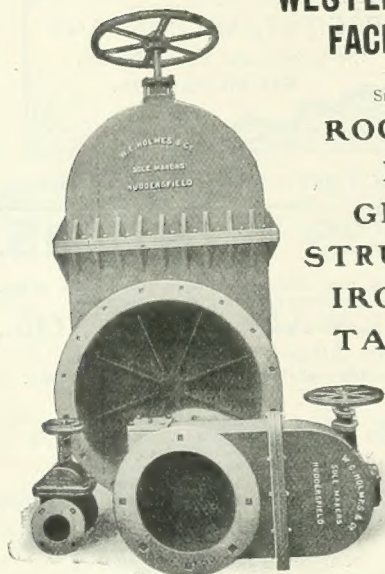
**"WESTERN" DOUBLE  
FACED VALVE.**

SPECIALITIES:—

**ROOFS,  
BRIDGES,  
GIRDERS,  
STRUCTURAL  
IRON WORK,  
TANKS, &c.**

Works—  
Huddersfield.

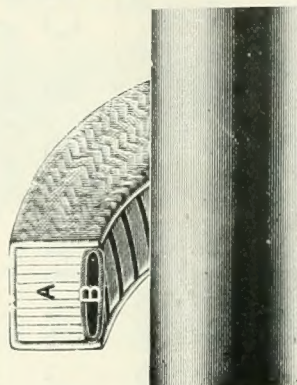
London Office—  
11, Victoria  
Street, S.W.



## THE PACKING OF PACKINGS

*Used by . .*  
British, United States, Dutch,  
Spanish, Japanese, etc.,  
Navies.

**UNITED STATES METALLIC  
PACKING CO., LTD.,  
BRADFORD.**



## S. REDFERN,

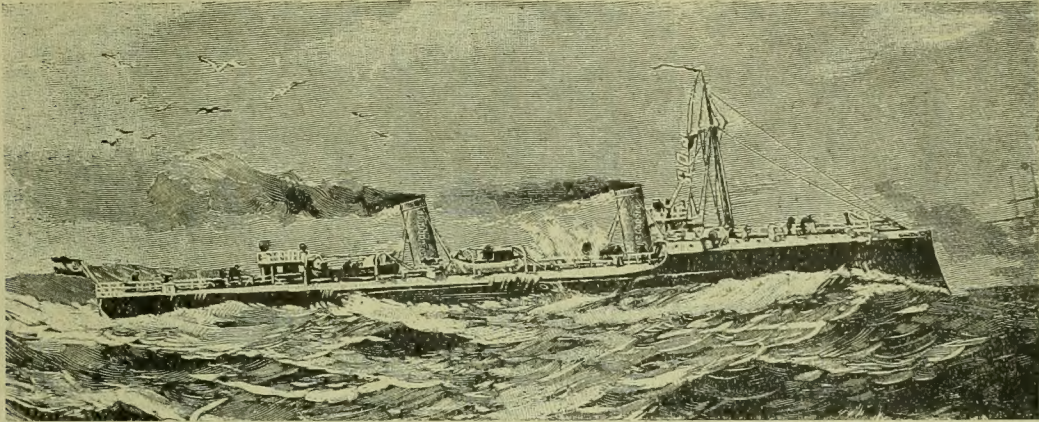
Swan Lane,  
New Brown St.  
**MANCHESTER.**

**METAL FACED  
PACKING**

Insures less friction  
on the rods, and  
therefore less wear  
and tear.



**F. SCHICHAU,** ENGINEER AND SHIPBUILDER,  
**Elbing-Danzig, Prussia.**  
**SEA-GOING TORPEDO BOATS AND CRUISERS**  
 With Speeds up to 36 knots per hour.



**TORPEDO-BOAT DESTROYER FOR THE IMPERIAL CHINESE NAVY.**

Speed, with complete outfit, armament, and 25 ton of coal in the bunkers, 35.2 knots—65.2 km.; with 67 ton of coal, 33.6 knots—62.2 km.

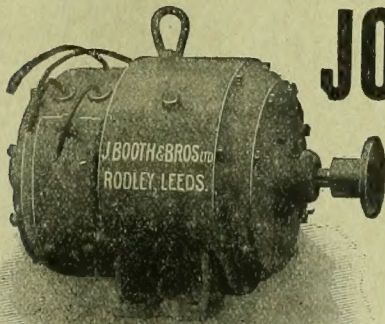
The Largest Ironclads and Mail Steamers.

Steamers for Sea and River Service.

Dredgers.

**STEAM ENGINES AND LOCOMOTIVES OF DIFFERENT TYPES.**

Works founded in 1837, employ at present 6,500 Workmen.



ENCLOSED MOTOR.

**JOSEPH BOOTH & BROS.**  
**LTD.,**

Electrical and Mechanical Engineers,

Telegrams:

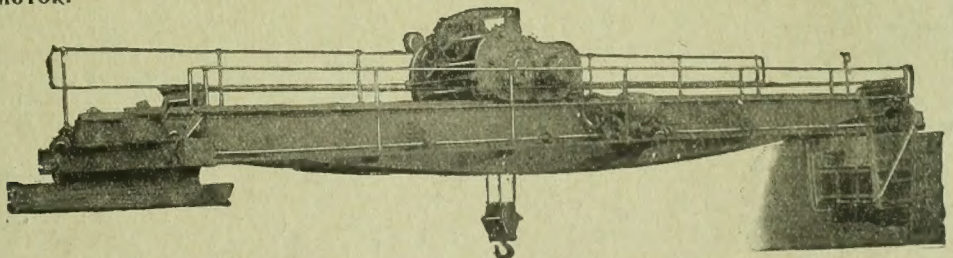
"CRANES, RODLEY."

**Rodley, LEEDS.**

Makers of Dynamos, Motors,

**Electric & Steam Cranes.**

Inquiries  
 Solicited.



THREE-MOTOR ELECTRIC OVERHEAD CRANE.

**Cranes.**

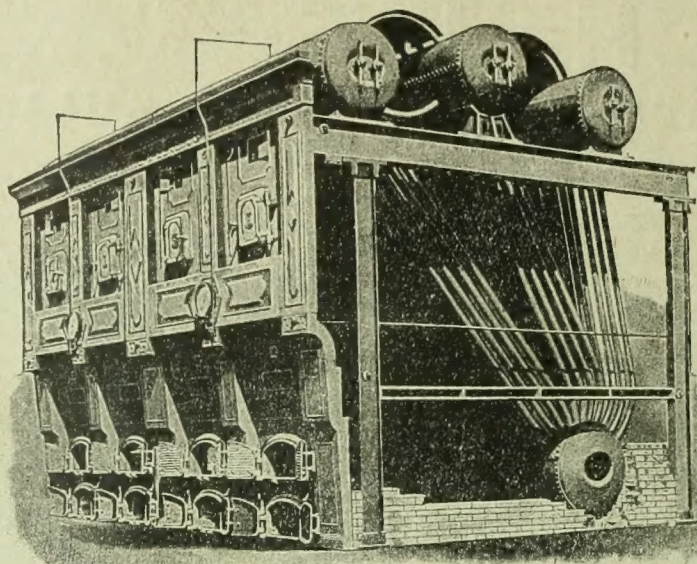
**Capstans.**

**Winding Machines.**

Makers to Home, Colonial, and Foreign Governments, and all Leading Firms.



# THE STIRLING BOILER CO., LIMITED.



Head Office and Works :—  
MOTHERWELL, N.B.

ECONOMICAL.  
COST  
REASONABLE.  
LOW  
MAINTENANCE.

London Office :  
25, Victoria St.,  
Westminster, S.W.

CONTRACTORS TO HIS MAJESTY'S AND OTHER GOVERNMENTS.

## JAMES FAIRLEY & SONS, TOOL STEELS

General Steel Manufacturers,  
and SPECIALISTS in . . .

Invite attention to their Unrivalled Self-hardening Steel.

### FAIRLEY'S SELF-HARDENING TOOL STEEL FOR HEAVY CUTS AT HIGH SPEEDS.

Is considered to be the HARDEST  
and TOUGHEST Steel yet made  
(although the cheapest in the  
Market). Small samples free to  
approved buyers.

NOTE.—JAMES FAIRLEY & SONS'  
WORKS (Bramall Lane, Sheffield,  
and Mill Street Forge and Rolling  
Mills, Birmingham) are merely  
Branch Departments, and

All Communications should be addressed to the Head Offices :—

OLD MINT, SHADWELL STREET, BIRMINGHAM.

Telegrams : "Gauze."

ESTABLISHED 1790.

Nat. Tel. : 3306.

## JOHN STANIAR & CO.,

Manchester  
Wire Works, MANCHESTER.

Wire Weavers and Perforators of all Metals.

